Skeletal Muscle Exercise
T-112-P
The Role of Prenyl Diphosphate Synthase Subunit 1 in Cellular Bioenergetics and Its Implications in Obesity
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Background: It has been previously reported that Coenzyme Q10 (CoQ10) deficiencies are linked to obesity and cardiovascular diseases (Quinzi 2007), however the mechanistic implications to cellular bioenergetics have not been well characterized. In the mitochondrial inner membrane, CoQ10 carries electrons from complexes I and II to complex III of the electron transport chain and plays a role in controlling reactive oxygen species levels. Mollet et al. (2007) demonstrated that mutations in the prenyl diphosphate synthase subunit 1 (PDSS1) gene, which codes for an important enzyme in CoQ10 biosynthesis, led to CoQ10 deficiencies. Our genome-wide associations studies (GWAS) in clinical populations of obese individuals have also identified PDSS1 as an important locus bearing significance to obesity and rate of weight loss (p<5X10-4).

Methods: The goal of this project was to extend our GWAS observations and evaluate the role of PDSS1 in mitochondrial bioenergetics, linking expression of PDSS1 to cellular energy expenditure and oxidative stress. An in vitro siRNA knockdown approach was used in mouse C2C12 myoblasts followed by bioenergetic determinations using an extracellular flux analyser.

Results: Following reduction of PDSS1 protein levels by 20 to 90%, a decrease of 30% in basal and maximal oxygen consumption was observed. In addition, state 4o respiration (proton leak) showed a two-fold increase.

Conclusions: We expect a reduction in CoQ10 levels in the paucity of PDSS1. Bioenergetic outcomes should be reversible by CoQ10 supplementation. Our GWAS findings have identified PDSS1 as a gene of interest. Knockdown of PDSS1 in myocytes was shown to significantly impair mitochondrial bioenergetics. Findings should enhance the understanding of the variability in the control and efficiency of energy metabolism in relation to obesity and associated conditions.

T-113-P
This abstract has been withdrawn.

T-114-P
Effects of 12-Weeks of Aerobic Exercise Training on Skeletal Muscle Mitochondrial Function and Insulin Sensitivity in Premenopausal Women: Preliminary Findings from the INTENSITY Study
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Background: While it is well known that aerobic exercise can improve skeletal muscle insulin sensitivity (SI) and the majority of studies demonstrate an improvement in mitochondrial bioenergetics, whether or not these improvements occur independent of negative energy balance (EB) remains to be determined. Purpose: To assess SI and skeletal muscle fatty acid and carbohydrate utilization in permeabilized muscle fibers under rigorously controlled EB conditions pre- and 12-weeks post aerobic exercise training (AET) in premenopausal women.

Methods: Methods: 18 women (age = 31±5 years, BMI= 25.7±3.8) were assessed at baseline and 12-wks post AET. Room calorimetry was used for 24 hrs to determine energy expenditure (EE), and to insure EB prior to euglycemic hyperinsulinemic clamp measures for SI. Muscle biopsies were obtained, and in situ mitochondrial function was determined in permeabilized muscle fibers using high-resolution respirometry.

Results: Significant increases were observed for State 4o (63%), State 3 (87%), State 4 (56%), and maximum uncoupled respiration (95%) rates using malate and palmitoyl-carnitine as substrates following AET (P < 0.05). No significant changes in respiration were observed for either carbohydrate or fat oxidation protocols. A significant improvement in SI occurred following AET (baseline SI clamp = 8.2 ± 3.9, 12wks-post = 10.3 ± 4.3; P < 0.05).

Conclusions: These preliminary data demonstrate an enhanced mitochondrial fatty acid metabolism and increase in SI following 12-weeks of AET even when changes in EB do not occur.

T-115-P
Timing of Exercise Relative to Meal Ingestion Affects 24 Hours Fat Oxidation
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Background: Consensus among literatures suggest that moderate doses of exercise doesn’t significantly increase 24 h fat oxidation, when energy balance over 24 h is achieved (Exer Sports Sci Rev. 37:93, 2009). However we recently found that exercise performed before breakfast oxidized more fat than that performed after breakfast during the 24 h period (Metabolism. 62:793,2013). The aim of this study was to determine whether 24 h fat oxidation was affected by timing of exercise relative to meals. Methods: Healthy young male and female were recruited to this study. Energy metabolism was measured with a room-size metabolic chamber. Subjects stayed in the chamber for 3 days populations of exercise (60 min @50% VO2 max, 100 min @65% VO2 max, or 2x50 min @65% VO2 max performed before breakfast, after lunch or after supper) or non-exercise control trial on day 2. 24 hours energy metabolism was evaluated from 0600h of day 2 to 0600h of day 3. Time courses of apparent energy and nutrient balance were estimated as difference between the input and output. Results: Energy expenditure during exercise and over 24 h were not affected by time when exercise was performed. Fat oxidation during exercise decreased when exercise was performed later on the day. 24 h fat oxidation increased only when exercise was performed before breakfast, compared with that of the other exercise session and non-exercise control. Conclusions: 24 hours fat oxidation was affected by timing of exercise relative to meals, and exercise before breakfast, a common practice among athletes and recreational runners, seems to be beneficial to reduce body fat. An exercise induced temporary energy deficit seemed to augment 24 h fat oxidation. Chronic effect of exercise performed before breakfast on body fat and appetite control remain to be studied.

T-116-P
Improvement in Physical Endurance by an Amino Acid Based hGH-Secretagogue: A Pilot Study
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Background: The ability of an oral optimized amino acid supplement (SeroVital™) to increase serum growth hormone (hGH) levels 120 minutes after oral administration in both men and women has been demonstrated, but evidence bridging repeated daily administration of the supplement to known benefits of hGH injections has not yet been established.

Methods: This pilot study included 12 [7 male, 5 female; age = 31±6 years; BMI= 25.7±3.8] healthy subjects. The supplement, a 2.9g/dose blend of l-lysine HCl, l-arginine HCl, oxo-proline, N-acetyl-l-cysteine, l-glutamine, and schizonepeta (aerial parts) powder, was taken orally on an empty stomach prior to bedtime every night for two-weeks with no other lifestyle changes. Schizonepeta is a well characterized supplement that has been demonstrated, but evidence bridging repeated daily administration of the supplement to known benefits of hGH injections has not yet been established.

Results: After 2 weeks of supplementation, mean VO2,max increased by 6% from 44.9 ± 8.1 at baseline to 47.7 ± 9.2ml/kg/min (3.69 ± 0.96 to 3.91 ± 1.02L/min), demonstrating a statistically significant improvement from baseline (P<0.02).

Conclusions: Increased measures of endurance are a well-established outcome of synthetic hGH-injections in adults. Here we show that two weeks of daily supplementation with the orally-administered amino-acid based hGH-secretagogue significantly increased VO2,max compared to baseline with no other lifestyle changes. A larger multi-center study is being planned.
T-117-P
Effects of Low Protein Diets on Food Intake, Energy Expenditure, and Body Composition in Obesity Prone Rats
Adel Pezeshki, Nicholas J. Yee, Prasanth K. Chelikani
Calgary, Canada

Background: Moderately low-protein diets increase food intake (FI) and very low-protein diets decrease FI. However, little is known of the effects of low-protein diets on energy expenditure (EE) and body composition (BC).

Methods: Obesity-prone Sprague Dawley rats (n=48) were allocated to 4 isocaloric diets with egg albumin contributing to either 14% (control; CON), 10% (moderately low-protein, MLP), 5% (low-protein, LP) or 0% (very low-protein, VLP) of total calories for 2 weeks (wks). FI and EE were monitored by a CLAMS system and BC recorded by an MRI system. Results: Compared to CON, MLP increased FI by 15-26% for 2 wks with the increase occurring during both the dark and light periods. The LP-induced hyperphagia (9-26%) was transient lasting a wk and was primarily due to an increase in dark period intake. VLP diet decreased FI by 20-50% during 2 wk with a reduction of both dark and light period intakes. With LP and VLP diets, EE during the dark and light periods were decreased (28 and 43% for LP, and 83 and 84% for VLP, on day 14, respectively). MLP did not affect EE. At 2 wks, VLP diets decreased weight, fat and lean mass by 37, 42 and 33%, and LP diets decreased weight and lean mass by 14 and 15%; MLP neither affected fat nor lean mass. Conclusions: Dietary protein deficiency appears to produce divergent effects on energy balance parameters: very low-protein diets decrease intake, energy expenditure and fat mass, whereas moderate low-protein diets are hyperphagic but without altering energy expenditure or body composition. Funding: ALMA, AI-Bio, AM, NSERC, CFI

T-118-P
Effects of Dietary Casein and Whey Protein on Energy Balance, Body Composition and Glucose Tolerance in Diet Induced Obese Rats
Adel Pezeshki, Andrew Fahim, Nicholas J. Yee, Prasanth K. Chelikani
Calgary, Canada

Background: The major milk proteins -casein and whey- are reported to decrease food intake (FI), however, little is known of the relative efficacies of these proteins in improving energy balance and diabetic control. Methods: Obesity-prone diet-induced obese Sprague Dawley rats (n=48) were randomized to 4 isocaloric dietary groups: 1) control high fat (CON; calories: 33% fat, 14% egg albumin); 2) casein (40% casein; CAS), 3) whey (40% whey protein isolate; WPI) or 4) combination of casein and whey (20% WPI + 20% CAS; WPCA) and continued for 6 weeks (wk). FI and energy expenditure (EE) were monitored by a CLAMS system and BC recorded by an MRI system. Results: WPI, CAS and WPCA groups reduced FI during first 10 days (d) by about 19%. On d 2 - 4, FI was reduced by 35 - 37% with WPI, by 17 - 25% with CAS and by 18 - 27% with WPCA. Despite a reduction in FI, the EE were similar among groups. From d 8 onwards, WPI and CAS decreased BW by 11% and 10% and WPCA tended to decrease BW by 6%. At 4 wk, WPI, CAS and WPCA decreased body fat (WPI, CAS and WPCA vs. CON; 15, 15, 16 vs. 18%) and increased body lean (WPI, CAS and WPCA vs. CON; 80, 80, 79 vs. 77%). WPI, CAS and WPCA improved glucose tolerance (28, 18 and 9%, respectively). Conclusions: Dietary whey and casein proteins decrease food intake and body weight and improve glucose tolerance, with whey being particularly more effective. Funding: ALMA, AI-Bio, AM, NSERC, CFI

T-119-P
Six Weeks High Fat Diet Does Not Reduce Access of Insulin to Skeletal Muscle
Josiane Brousseau, Ana Valeria B. Castro, Richard N. Bergman, Cathryn M. Kolka
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Background: Insulin access to skeletal muscle is impaired in models of obesity, and we have shown that diet-induced insulin resistance reduces dispersion of insulin through skeletal muscle. Thus, we expected that a reduced amount of insulin would be detected in the interstitial fluid of the diet-induced obese animal. Methods: Dogs were fed either control diet, or six weeks of a high fat diet. Anesthetized dogs were exposed to basal insulin levels for 180min followed by hyperinsulinemia (1mU/mm/kg); glucose was infused at a variable rate to maintain euglycemia. Samples were taken from femoral artery, vein, and lymph vessels. Results: Fat feeding reduced the glucose infusion rate (lean 11.7±1.1mg/min/kg, vs obese 8.1±0.8mg/min/kg, P<0.02), and leg glucose uptake (38.0±11.0 vs 26.4±6.0mg/min/kg in lean and obese, respectively), indicating insulin resistance. At the end of the clamp, arterial levels were 80.6±10.4mU/L in lean animals, compared to 93.0±5.0 in obese animals (n=8 per group), while lymph (interstitial) insulin concentrations were 63.4±11.5 and 55.0±4.4mU/L in lean and obese respectively. Thus, at steady state, the ratio of lymph:plasma insulin was 0.58±0.02 in lean, 0.59±0.03 in obese animals, suggesting no significant impairment in insulin access to the interstitial space after six weeks of fat feeding, yet cellular insulin sensitivity was decreased (Scellular = ΔGINF (Alymph insulin x Glucose) (lean 2.76±0.44, vs obese 1.62±0.18 dl/min/kg per µU/mL, P<0.02). Conclusions: Therefore we conclude that insulin resistance induced by six weeks of a high fat diet is likely due to cellular insulin resistance, rather than a defect in insulin access. Further experiments are required to assess insulin access under lower insulin concentrations, or in animals with more severe insulin resistance.

T-120-P
Both Temperature Perturbations and Genetic Ancestry Regulate mitochondria Function Differentially in Populations Divergent in Energy-Expenditure Traits
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Background: Mitochondrial bioenergetics is intimately related to metabolic rate, energy expenditure, growth and adiposity. Individual differences in mitochondrial function both in static conditions and in response to environmental perturbations, such as changes in ambient temperature, may contribute to variations in these traits. The causes of variation in mitochondrial function across populations are incompletely known. To address this we use a non-model organism from natural populations that offers a unique window into response to temperature variations. Methods: We use closely-related populations of garter snakes (Thamnophis elegans) that are adapted to disparate habitats and represent slow-lived and fast-lived phenotypes characterized by their divergence in growth rate, body shape, reproductive output, and longevity. We measured mitochondrial genetic variation, and liver mitochondrial respiration and transcription under control and heat stress. Results: We found significant stress, phenotype, and phenotype-by-stress effects. A 2-hour organismal heat stress increases (i) mitochondrial respiration during production of ATP at 27°C, and (ii) the expression of mitochondrial rRNAs. Between phenotypes mitochondrial function diverged in both resting mitochondrial respiration and mitochondrial sequences with non-synonymous changes. Interactions between stress and phenotype suggest the slow-lived phenotype maintains a high level of metabolic capacity across treatments, whereas the fast-lived phenotype increases mitochondrial respiration and gene expression to meet energetic demands of the stress. Conclusions: These results demonstrate the contribution of environmental perturbations, genetic ancestry, and their interactions in regulating mitochondria function; and support the association between mitochondrial bioenergetics and energy-expenditure traits across populations.

T-121-P
Possibility of Plasma Free Amino Acid Profiling as a Versatile Surrogate Indicator for Metabolic Syndrome in Japanese Subjects
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Background: Metabolic complications associated with obesity are prevailing among Japanese subjects. As well as visceral fat accumulation, insulin resistance is also pivotal in many cases considering the development of metabolic syndrome and consequent atherosclerosis risk. However, it is still uncertain whether visceral fat accumulation and insulin resistance are independent factors for development of metabolic syndrome. We have previously reported that plasma free amino acid (PFAA) levels were associated with visceral fat accumulation in Japanese subjects whose visceral fat area (VFA) was determined using computed tomography (CT) imaging (Clinical Obesity 2012;2:29-40). Methods: In this study, we analyzed the relationship between visceral fat accumulation and insulin resistance from the aspect of PFAA profiles statistically using 1190 healthy Japanese subjects (826 males and 364 fe-
males) who had undergone VFA measurement using CT imaging and/or oral glucose tolerance test (OGTT). PFAA concentration was measured using HPLC–ESI–MS, followed by precolumn derivatization. Results: Hierarchical cluster analysis using those correlation coefficients matrix showed interesting features, which strongly suggested that both insulin resistance and some PFAA profiles were closely associated with visceral fat accumulation. Then we performed multivariate linear regression analysis for VFA estimation using PFAA profiles as explanatory variables. We obtained the formula which showed highly significant correlation with VFA (r²=0.55). Interestingly, the obtained formula also significantly correlated with several indices for insulin resistance, hyperinsulinemia, pre-diabetes, and diabetes. Conclusions: These results strongly suggest that PFAA profiling is a versatile surrogate indicator for metabolic syndrome in Japanese adults.

T-122-P
Dietary BCAA Intake Is Inversely Correlated with Insulin Resistance in the Newfoundland Population
Dany Wydadd, Alecia Rideout, Farrell Cahill, Peyvand Amini, Sangeetha Vidyasankar, Edward W. Randall, Wayne Gulliver, Guang Sun. St. John’s, NL, Canada
Background: Branched-chain amino acids are essential to human health. Our laboratory and others have documented an inverse relationship between dietary BCAA intake and adiposity at the population level. However, whether this beneficial relationship can be translated to insulin resistance, a common obesity-associated condition, is unclear. Our objective was to assess the relationship between dietary BCAA intake and insulin resistance in the Newfoundland population. Methods: A total of 2291 subjects of Newfoundland descent were recruited from the ongoing population-based CODING Study. Serum glucose and insulin were measured, and the homeostatic model assessment was used to evaluate insulin resistance (HOMA-IR) and beta-cell function (HOMA-β). Dietary BCAA intake was computed using the Willett Food Frequency Questionnaire (FFQ) and Nutribase 9. Body composition was assessed by Dual-energy X-ray absorptiometry. Results: Partial correlation analysis controlling for age and caloric intake showed that in the entire cohort, dietary BCAA intake (g intake/kg b.w./day) was inversely correlated with HOMA-IR, HOMA-β, and fasting insulin and glucose (range of r=-0.12 to -0.22, P<0.01). When the cohort was grouped based on gender, all aforementioned relationships remained significant in women. However in men, dietary BCAA intake was correlated only with HOMA-IR, HOMA-β, and fasting insulin concentration. Additionally ANCOVA controlling for age, gender and caloric intake, found that the high HOMA-IR tertile consumed less dietary BCAAs as compared to the low HOMA-IR tertile. Conclusions: Our results suggest that higher dietary BCAA intake is associated with lower insulin resistance at the population level.

T-123-P
 Branched-Chain Amino Acid-Related Signature of Visceral Obesity and Cardiometabolic Risk Factors
Marie M. Boulet, Melissa Pelletier, André Marette. Quebec, Canada; Julia Scarp, Cornelia Prehn, Jerzy Adamski. Neuherberg, Germany; Andre Techenof. Quebec, Canada
Background: Metabolomic profiling of obese individuals revealed high blood levels of branched-chain and aromatic amino acids. C3 and C5 acylcarboxylate concentrations are also raised. Whether this signature applies to visceral obesity and cardiometabolic risk factors is important to greater FFA clearance in African American (AA) women after intravenous glucose. Whether ethnic differences in glucose or FFA flux are present after a mixed meal (MM) is unknown. Methods: We measured plasma glucose, FFA and insulin concentrations during a 3h insulin-modified frequently-sampled intravenous glucose tolerance test and 6h after a MM in 13 AA and 15 Caucasian (CC) obese premenopausal women. Conclusions: Our laboratory and others have documented an inverse relationship between dietary BCAA intake and adiposity at the population level. However, whether this beneficial relationship can be translated to insulin resistance, a common obesity-associated condition, is unclear. Our objective was to assess the relationship between dietary BCAA intake and insulin resistance in the Newfoundland population. Methods: A total of 2291 subjects of Newfoundland descent were recruited from the ongoing population-based CODING Study. Serum glucose and insulin were measured, and the homeostatic model assessment was used to evaluate insulin resistance (HOMA-IR) and beta-cell function (HOMA-β). Dietary BCAA intake was computed using the Willett Food Frequency Questionnaire (FFQ) and Nutribase 9. Body composition was assessed by Dual-energy X-ray absorptiometry. Results: Partial correlation analysis controlling for age and caloric intake showed that in the entire cohort, dietary BCAA intake (g intake/kg b.w./day) was inversely correlated with HOMA-IR, HOMA-β, and fasting insulin and glucose (range of r=-0.12 to -0.22, P<0.01). When the cohort was grouped based on gender, all aforementioned relationships remained significant in women. However in men, dietary BCAA intake was correlated only with HOMA-IR, HOMA-β, and fasting insulin concentration. Additionally ANCOVA controlling for age, gender and caloric intake, found that the high HOMA-IR tertile consumed less dietary BCAAs as compared to the low HOMA-IR tertile. Conclusions: Our results suggest that higher dietary BCAA intake is associated with lower insulin resistance at the population level.

T-125-P
Minimal Model of Postprandial Glucose and Free Fatty Acid Kinetics in Obese African American and Caucasian Women
Yanjun Li, Bernard V. Miller, Vipul Periwal, Anne E. Sumner. Bethesda, MD
Background: Minimal models of glucose and FFA kinetics are likely improved by adding postprandial glucose and free fatty acid (FFA) responses. Methods: Blood samples were obtained from 59 African American (AA) and 15 Caucasian (CC) obese premenopausal women. Glucose and FFA kinetics were determined using mathematical modeling. Results: We have shown that a higher acute insulin response to glucose (AIRg) is important to greater FFA clearance in African American (AA) women after intravenous glucose. Whether ethnic differences in glucose or FFA flux are present after a mixed meal (MM) is unknown. Methods: We measured plasma glucose, FFA and insulin concentrations during a 3h insulin-modified frequently-sampled intravenous glucose tolerance test and 6h after a MM in 13 AA and 15 Caucasian (CC) obese premenopausal women. Conclusions: Our laboratory and others have documented an inverse relationship between dietary BCAA intake and adiposity at the population level. However, whether this beneficial relationship can be translated to insulin resistance, a common obesity-associated condition, is unclear. Our objective was to assess the relationship between dietary BCAA intake and insulin resistance in the Newfoundland population. Methods: A total of 2291 subjects of Newfoundland descent were recruited from the ongoing population-based CODING Study. Serum glucose and insulin were measured, and the homeostatic model assessment was used to evaluate insulin resistance (HOMA-IR) and beta-cell function (HOMA-β). Dietary BCAA intake was computed using the Willett Food Frequency Questionnaire (FFQ) and Nutribase 9. Body composition was assessed by Dual-energy X-ray absorptiometry. Results: Partial correlation analysis controlling for age and caloric intake showed that in the entire cohort, dietary BCAA intake (g intake/kg b.w./day) was inversely correlated with HOMA-IR, HOMA-β, and fasting insulin and glucose (range of r=-0.12 to -0.22, P<0.01). When the cohort was grouped based on gender, all aforementioned relationships remained significant in women. However in men, dietary BCAA intake was correlated only with HOMA-IR, HOMA-β, and fasting insulin concentration. Additionally ANCOVA controlling for age, gender and caloric intake, found that the high HOMA-IR tertile consumed less dietary BCAAs as compared to the low HOMA-IR tertile. Conclusions: Our results suggest that higher dietary BCAA intake is associated with lower insulin resistance at the population level.

T-124-P
Metabolite Differences in Countries Spanning the Epidemiologic Transition; A Risk for Type 2 Diabetes?
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Background: The worldwide prevalence of type 2 diabetes (T2D) differs according to a country’s economic status. In developing countries, the 20 year projected increase in T2D is estimated to be 69% vs. only 20% in developed countries. Using metabolomics, we sought to characterize metabolites associated with obesity and T2D. Methods: The Modeling the Epidemiologic Transition Study (METS) is a longitudinal study, in 5 countries spanning the epidemiologic transition. METS is exploring obesity and T2D risk in populations of African origin: Ghana (GH), South Africa (SA), Seychelles (SEY), Jamaica (JA) and the US. Mass spectrometry based metabolomics were performed on a representative sub-sample of 80 women from 2 sites, GH and US. Participants were matched using a space filling design in a multivariate space calculated from baseline descriptors (BMI, age, body fat %). Results: We found clear metabolic site differnces, as well as individual responses, with 2 women from GH displaying similar metabolic profile to those of the US. Conclusions: This study highlights differences in amino acids, lipids and other dietary-related metabolites in populations spanning the epidemiological transition and which may contribute to a greater increase of T2D in developing countries.
Insulin Signaling
T-127-P
Protease 3 and Insulin-Like Growth Factor Binding Protein-3 Proteolysis Are Associated with Insulin Resistance in Adolescents with Obesity
Edmond P. Wickham, Trang Le, Qing Cai, Youngman Oh Richmond, VA
Background: Obesity is associated with increased proteolysis of a specific insulin-like growth factor binding protein (IGFBP-3); however, the mechanisms responsible for this degradation are unclear. Intact IGFBP-3 improves insulin signaling through activation of a dedicated receptor; therefore, we propose that obesity-associated reductions in IGFBP-3 contribute to insulin resistance. Moreover, we propose that neutrophil serine proteases, including protease 3 (PR3), are associated with IGFBP-3 proteolysis. Therefore, we investigated the relationships between PR3, IGFBP-3 proteolysis, and estimates of insulin resistance among obese adolescents. Methods: Serum PR3 levels and IGFBP-3 proteolysis were determined via Western immunoblot analysis in 9 obese (body mass index [BMI] ≥95th percentile) adolescent males and females, ages 11-18 years, after an overnight fast. Subjects also underwent a standard 75-gm 2-hour oral glucose tolerance test, and insulin sensitivity was estimated using the whole body insulin sensitivity index (WBISI). Results: Insulin-resistant adolescents (WBISI ≤2) with obesity (n=5) demonstrated increased PR3 levels and IGFBP-3 fragments compared with insulin-sensitive adolescents (WBISI >5) with obesity (n=4). Considering all subjects (n=9), PR3 correlated positively with IGFBP-3 proteolysis (r=0.335, P<0.01). Moreover, both PR3 levels (r=-0.688, P<0.05) and IGFBP-3 proteolysis (r=-0.702, P<0.05) negatively correlated with WBISI. Conclusions: Increased PR3 and IGFBP-3 proteolysis are associated with worsening insulin resistance in adolescents with obesity. Additional mechanistic studies are warranted to determine if increased neutrophil serine protease activity contributes to the pathophysiology of obesity-induced insulin resistance via the degradation of intact IGFBP-3.

Higher Morning Cortisol Is Associated with Disordered Glucose Metabolism in Middle Age Men and Women the Framingham Offspring Study
Nicole L. Glazer, Susan Hwang, Melanie M. Mott, Vasan S. Ramachandran, George T. O’Connor, Andrea D. Covelli Boston, MA
Background: Cushing’s syndrome (hypercortisolism) is associated with obesity, metabolic syndrome, hypertension, and type 2 diabetes (T2D). The role of lesser degrees of hypercortisolism in metabolic disease, particularly T2D, is controversial. Our objective was to determine if higher morning cortisol levels are associated with impaired fasting glucose (IFG) and T2D in community dwelling men and women in the Framingham Offspring Study (FOS). Methods: Fasting morning serum cortisol (7:30-9:30 AM) and fasting plasma glucose (FPG) were measured in 830 men and women participants at FOS exam 5 or 6 who were not taking exogenous glucocorticoids (mean age 58 years, 52% female). Cross-sectional associations between morning cortisol levels and prevalent IFG (FPG ≥ 100 mg/dl) and T2D (FPG ≥ 126 mg/dl or use of medications) were determined with multivariable logistic regression adjusting for age, sex, BMI, current smoking, and alcohol use. Results: IFG prevalence was 23% (men 30%, women 17%) and T2D 8% (men 11%, women 6%). Morning serum cortisol levels were higher in those with IFG compared to those with normal FPG (15.8±7.2 vs 13.9±6.6 mcg/dl, respectively) and in those with T2D compared to those without T2D (17.6±8.5 vs 15.0±6.5 mcg/dl, respectively). A 1 mcg/dl increase in cortisol was associated with 3% higher odds of IFG (OR 1.03, 95%CI 1.01, 1.06; p=0.01) and 7% higher odds of T2D (OR 1.07, 95%CI 1.03, 1.11; p=0.001) adjusting for the above risk factors. There was no evidence of effect modification by sex (Interaction p-value=0.5 for IFG, =0.8 for T2D). Conclusions: Higher morning serum cortisol was associated with prevalent IFG and T2D in middle age community dwelling men and women. Targeting interventions to factors known to dysregulate cortisol metabolism such as stress, depression, and poor sleep may improve obesity and glucose metabolism and prevent T2D.
T-130-P
Measures of Perseveration Predict Ad Libitum Energy Intake and Augment the Effects of Cognitive Restraint in Adults Seeking Weight Loss
Alexus Graham, Marci E. Gluck, Susanne B. Votrub, Jonathan Krakoff, Marie S. Thearle Phoenix, AZ

Background: Studies have reported associations between performance on tests of executive function and obesity or maladaptive eating behaviors. Our aim was to determine whether executive function is associated with ad libitum energy intake (EI). Methods: Subjects were obese, healthy individuals (40±38M; age 36±10y; BMI 37.8±7.2 kg/m²; %fat 43.0±6.7%) enrolled in weight loss studies which included a baseline measure of ad libitum EI over 3-days using a validated vending paradigm. Participants completed the Iowa Gambling Task to evaluate decision making, the Stroop Word Color Task to assess attention, the Wisconsin Card Sorting Task (WCST) to measure perseverative errors (PE), and the Three Factor Eating Questionnaire (TFEQ) to measure disinhibition and cognitive restraint (CR). Results: Only results from the WCST and the TFEQ associated with EI. When expressed as a percentage of an individual’s calculated weight maintaining energy needs (%WMEN; [mean daily energy consumed/WMEN]*100), EI correlated positively with number of PE (r=0.24, p=0.03) and negatively with CR (r=-0.51, p<0.0001). In a regression model of EI (r²=0.59, F=11.0, p<0.0001) including age, sex, race, disinhibition, CR, and PE T-score, an interaction between PE and CR was observed (p=0.05). Increased PE intensified the effect of CR such that subjects with high CR and high PE ate the least (median=70% WMEN), while those with low CR and high PE ate the most (130% WMEN). Subjects with low PE and high versus low CR ate a median of 84% and 112% WMEN respectively. Conclusions: In obese subjects seeking weight loss, perseveration augments the effects of dietary restraint which may contribute to the increased EI exhibited by some subjects if self-control is undermined. This interaction may explain difficulties some individuals encounter in maintaining effective long-term lifestyle changes.

T-131-P
Does Body Composition Influence Physical Fitness and Pain Reports in Adolescents?
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Background: To examine pain reports, physical fitness, and body composition in adolescents of normal and overweight/obese status. Methods: 20 adolescents (10 male, 10 female; 15.0 ± 2.0 years) completed three sessions: one familiarization and two counterbalanced experimental [treadmill (TM) and DEXA]. The TM session involved measurement of blood pressure, heart rates, and energy expenditure. The DEXA session involved measurement of body density and percent body fat. Concurrent measurements of maximum pain intensity during the two exercise conditions were used to calculate pain intensity ratings. Results: Significant differences were seen between the normal weight (NW) and overweight (OW) groups in maximum pain intensity, % fat, and weight. NW adolescents reported significantly lower pain intensity and % fat than OW adolescents. Conclusions: The results of this study suggest that body composition is related to physical fitness and pain reports in adolescents.

T-132-P
Abdominal Redistribution of Fat as a Potential Etiology of Disrupted Glucose Homeostasis in Non-Diabetic Schizophrenic Patients Treated with Atypical Antipsychotics
Mamta Supra, Donna M. Lawson, Ali Iranmanesh Salem, VA

Background: Use of atypical antipsychotics has been associated with weight gain and its metabolic consequences. In this study, effects of typical and atypical antipsychotics therapy on body weight/body composition, insulin sensitivity, and circulating adipokines, inflammatory markers and cytokines were assessed. Methods: Study was conducted in 2 groups of men, G1 (95, age: 57-64 yrs) and G2 (99, age: 42-62 yrs), respectively treated with typical and atypical antipsychotics. Excluded were men with active substance abuse, DM and thyroid disorders. In addition to neuropsychiatric evaluation and anthropometric measurements, blood samples were collected in the morning after an overnight fast in each subject for the measurements of glucose, insulin, leptin, adiponectin, CRP, and TNF-α. Body composition was determined by DEXA. Fat mass index (FMI), trunk fat mass index (FMI), and waist/height ratio were calculated. Student’s t-test was used for statistical analysis. Results: Percentage body fat and FMI were not significantly different in the 2 groups (G1/G2). Of contrast were significantly increased waist/height ratio (0.55±0.02 v 0.62±0.02; P<0.04) and FMI (3.3±0.5 v 5.3±0.6; P=0.04, associated with increased peripheral insulin resistance (HOMA-IR: 1.5±0.3 v 4.0±0.7; P<0.02) in men treated with atypical antipsychotics. Measures of leptin, adiponectin, CRP, and TNF-α were comparable in the 2 groups. Conclusions: Increased waist/height ratio and FMI in the presence of comparable percentage body and FMI are suggestive of abdominal obesity as the underlying mechanism for peripheral insulin resistance associated with the use of atypical antipsychotics. Future studies involving larger number of subjects are warranted to verify the present findings.

T-133-P
Hormonal, Metabolic and Dietary Characteristics in Food Addicted Obese
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Background: Obesity is a complex disease with heterogeneous etiology. Results from our general Newfoundland (NL) population revealed that food addiction contributes to obesity and represents a subset of the obese subjects. What makes obese with food addiction different from obese without food addiction? The objectives are to detect characteristic biomarkers in obese with food addiction. Methods: Among a total of 652 adult subjects recruited from the NL population, 17 food addicted obese (FAO) and 17 non-food addicted obese subjects were selected. Neuropeptides (α-MSH, β-endorphin, cortisol, melatonin, Neurtensin, Orexin-A, Oxytocin and Substance P), metabolism regulating hormones (amylin, C-Peptide, ghrelin, GIP, GLP-1, glucagon, IL-6, insulin, leptin, MCP-1, PP, PYY and TNFα) were measured using fastening morning serum samples. Obesity was measured using dual-energy X-ray absorptiometry and BMI. Food addiction was diagnosed using the Yale Food Addiction Scale (YFAS). The intake of macro- and micro-nutrients were computed from the Willet Food Frequency Questionnaire. Results: FAO had significantly lower levels of glucagon, TNFα and cortisol than NFO (p<0.005). A negative correlation between BMI and glucagon was found in FAO. No significant difference was seen in serum glucose and lipids between the two groups. FAO individuals consumed more calories from fat, and greater amount of dietary lactose, calcium, vitamin D and vitamin B12, however lower amount of dietary glucose, fructose, trans monounsaturated fat and Vitamin K1 as compared to NFO. Conclusions: This is the first study reported that obese individuals with food addiction may differ from other obese individuals in endocrine and dietary factors.
T-134-P
A Community-Based Weight Loss Intervention in Obese Adults Improves Adipose Tissue Circulating Factors Independently of Baseline Glucose Tolerance
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Background: Obesity is associated with metabolic dysfunctions, which may be mediated by changes in adipose tissue signaling factors. These molecules are denoted as Adipose Tissue Generated Mediators of CardioVascular Risk (ATGMVCVR) in this study, and include leptin, adiponectin, C-reactive protein (CRP), interleukin 6 (IL-6), tumor necrosis factor alpha (TNFa), and plasminogen activator inhibitor 1 (PAI-1). We studied the response of ATGMVCVR in obese adults with prediabetes in a random subset of subjects in the Healthy Living Partnerships to Prevent Diabetes trial. Methods: Subjects were randomized to a usual care (UC; n=15) or a lifestyle weight loss group (LWL; n=15). WLW was a community-based weight loss intervention to promote physical activity and healthy eating. ATGMVCVR at 1-y was compared between groups by analysis of covariance; baseline value of the mediator was the covariate. Baseline means for ATGMVCVR were compared between those with (n=21) and without (n=9) metabolic syndrome (MetS). Results: At baseline, subjects were 58±9 (SD) yrs, 70% female, with a BMI of 34±4 kg/m2. Weight loss (%) at 1-y was 7.8±6.0% for WLW and 1.7±4.5% for UC. Group differences at 1-y were noted (adjusted means[95%CI] for UC and WLW, respectively; p<0.05) for log adiponectin (8526.3 [7397.7,9827]; 10870.9 [9432.0,12529.3] pg/ml), leptin (30.4 [26.1,35.4]; 23.7 [20.3,27.5] pg/ml), IL-6 (0.4 [0.3,0.5]; 0.2 [0.1,0.2] pg/ml), and PAI-1 (50 [42.7,58.7]; 36.2 [30.8,42.4] pg/ml) with trends for group differences for CRP (0.2 [0.1,0.2]; 0.2 [0.1,0.2] mg/dl; p=0.17) and TNFa (10.6 [8.7,12.8]; 13.5 [11.1,16.3] pg/ml; p=0.08). No differences in baseline ATGMVCVR were seen between subjects with and without MetS. Conclusions: These findings suggest that ATGMVCVR can be improved with weight loss; further studies are needed to determine if metabolic dysfunction is also improved.

T-135-P
Body Fat and Central Adiposity Are Similarly Affected by Four Types of Sugars When Consumed as Part of a Usual Diet
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Background: It has been argued that because fructose is metabolized in the liver differently than glucose, the consumption of fructose may cause a number of adverse health consequences, such as adiposity, particularly in the abdominal region. Of particular importance, some investigators have further suggested that when fructose is consumed together with glucose as in sucrose and high fructose corn syrup (HFCS), the above mentioned adverse health consequences may also be observed. However, prospective studies are lacking on the effects of fructose, glucose, sucrose, and HFCS on body composition and trunk fat. Therefore, this study was conducted to address this gap.
Methods: As part of a ten-week eucaloric diet, 123 adults aged 20-60 years old were randomly assigned to consume 1% fat milk sweetened with either fructose (9%), glucose (9%), sucrose (18%), or HFCS (18%) of total calories, respectively. These levels represent the 50th percentile population consumption level of fructose in the American diet. Body fat mass, fat free mass, and abdominal (trunk) fat were measured using iDEXA (GE). Results: Although adults in all four groups experienced slight increases in body mass, body fat, abdominal (trunk) fat, and waist circumference, none of these measures were influenced by the type of added sugar consumed and no group experienced significant increases in body fat or central adiposity. Total energy intake and fat free mass were unchanged in any group. Conclusions: Consumption of fructose, glucose, sucrose, and HFCS when consumed at 50th percentile population did not produce any sugar specific (mono or di saccharide) response.

T-136-P
Obesity and Overfeeding Effects on Oscillatory Secretion of Insulin and Glucagon: Disruption of β-cell Function by Rapid Weight Gain Prior to Impaired Glucose Tolerance
Yanhua Peng, Cassandra M. Nicotra, William Leeds, Barbara C. Hansen
Tampa, FL
Background: In obesity, one of the hallmarks of islet secretory function is the exaggerated release of insulin into the circulation in a sinusoidal wave pattern with a dominant frequency normally between 8 and 12 minutes per cycle in both humans and nonhuman primates. We sought to determine the effects of obesity and of overfeeding on the oscillatory pattern of production and release of insulin and glucagon and the role of glucose in the ultimate disruption of this key indicator of pancreatic function. Methods: In the present study, 28 obese and normal weight rhesus monkeys were studied at baseline and additionally 9 normal weight healthy male monkeys were studied at increasing levels of forced overfeeding (OF) (100 to 175% of baseline intake) for up to 14 weeks, thus producing rapid weight gains of 20 to 80% depending upon duration and magnitude of OF. Patterns of glucose, insulin and glucagon were analyzed by spectral analysis and cross-correlation. Results: At increasing levels of OF, the oscillatory secretory function of β cells and of α cells became exaggerated (insulin baseline 86.1±29.6 vs OF 233±166.1 μU/ml, Xs±SD) without change in period (glucose 10.6±4.5 min, insulin 9.9±4 min, and glucagon 10.6±4 min with mean half amplitudes 4.0, 35 and 15%). Of disrupted these despite sustained hyperinsulinemia (periods n.s.) with no effect on glucose tolerance Conclusions: Pancreatic function suffers major disruption with deterioration of oscillatory secretory patterns during overfeeding, despite secretory levels being exaggerated in obesity. This endocrine dysfunction occurs well before impaired glucose tolerance and before any early signs of diabetes, and constitutes one of the earliest markers of pcdDM, dysmetabolism and pancreatic dysfunction.

T-137-P
Can Meal Composition Alter Overnight Glucose and Insulin Responses in Obese Individuals with Impaired Fasting Glucose Levels?
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Background: The purpose of this study was to examine how the dinner meal composition alters the postprandial, overnight, and fasting morning glucose and insulin response in prediabetic/obese individuals with impaired fasting glucose levels. Methods: Subjects (n=6) were studied on two occasions: dinner meal (800 kcal) either high carbohydrate (20% protein, 60% CHO-2 g fructose, 20% fat) or a high fat/high fructose meal (10% protein, 50% CHO-48 g fructose, 40% Fat) at 1800 h. Blood samples were drawn every 15 min from 1730 h until 0700 h, and analyzed for glucose, insulin, and c-peptide levels. Results: Subjects were 48±3±2.5 y, BMI 35.8±5.1 kg/m2 and fasting blood glucose of 144.9±15.7 mg/dL. Glucose area under the curve for the 14 h (IAUC) was not different between meal conditions but insulin IAUC was significantly greater with the CHO meal than the HF meal (insulin: 1,078.5±72.45 vs 965.189±198.803 pg/mL*min (14 h), P=0.02). Insulin IAUC was greater from 0300 vs 0700 h, while insulin levels showed a 33% decrease (P=0.05). Hepatic extraction of insulin (%) was lowest 2 h postprandial (68%±4%) and increased by 2300 h and continued to increase throughout the night with the highest extraction at 0600 h (81±3%, P=0.000), regardless of meal composition. Conclusions: In conclusion, the glucose response to the meal was similar for a high fat/high fructose and CHO dinner, while the insulin response was greater with the CHO meal. The dawn phenomena was observed under both meal conditions with glucose levels rising and insulin levels declining, which appears to be due to an increase in hepatic insulin extraction in the overnight period.

T-138-P
Hyperinsulinemia: The Common Factor in the Metabolic Syndrome
Greenville, NC
Background: Previous documentation of hyperinsulinemia in type 2 diabetes led us to question if elevated serum insulin levels is a common factor in the multiple disorders of the metabolic syndrome. Methods: A meta-analysis was performed to determine if hyperinsulinemia was present in the various metabolic syndrome components. Manuscripts were identified through MEDLINE via PubMed and Google Scholar and by searching reference lists of relevant papers and reviews. A pre-determined criterion was used to select manuscripts that examined metabolic syndrome disorders and included documentation of either serum insulin levels or C-peptide concentrations in human subjects. Results: A total of 357 abstracts were reviewed. Fifty-four
of these articles were selected due to appropriate documentation of insulin measurements. Comparisons were made based on if the studies reported patients as having elevated insulin levels (+) versus normal insulin levels (-) for each metabolic disorder: central obesity (BMI > 30 kg/m2), dyslipidemia (4+ vs. 0-), hyperglycemia (4+ vs. 0-), hypertension (7+ vs. 0-), diabetes mellitus (4+ vs. 0-), and dyslipidemia (4+ vs. 0-). For each metabolic disorder, a comparison was made between the control group and the intervention group.

Conclusions: Hyperinsulinemia is a common factor found in the multiple medical disorders of the metabolic syndrome. Checking serum insulin levels in a primary care setting may prove to be an essential tool for early diagnosis and preventative care.

T-139-P
A High Energy Diet Potentiates Epinephrine-Induced Increases in Blood Glucose Concentrations in Male Rats
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Background: In humans, non-alcoholic fatty liver disease (steatosis) is characterized by an accumulation of liver lipids. In rodents, steatosis has severe consequences, including oxidative stress and hepatic insulin resistance. It is well established that epinephrine stimulates hepatic glucose release during a stress response. The present experiment tested whether hepatic steatosis compromises this critical effect of epinephrine.

Methods: Adult male Sprague-Dawley rats were fed a high-energy cafeteria-style diet (HED). Weight gain during the first 3 days on the diet was used to divide the rats into a HED-Lean group (bottom 33%) and HED-Obese group (top 33%). After 9 weeks, the rats were injected with epinephrine (0.1 mg/kg sc), and blood glucose concentrations were measured.

Results: Compared to control rats, HED-Obese rats gained a significant amount of body mass, developed steatosis, insulin resistance and elevated basal glucose concentrations. HED-Lean and control rats did not differ on these measures. Interestingly, epinephrine produced remarkably larger increases in blood glucose concentrations in HED-Obese rats than in control rats. A smaller potentiation was observed in HED-Lean rats. To test whether these effects could be reversed, the high-energy components of the diet were removed for 4 weeks and the epinephrine injections were repeated. The diet intervention did not reverse the effects of the HED on body mass, baseline blood glucose concentrations, or steatosis, but did reverse the insulin resistance and attenuated the potentiated effects of epinephrine on glucose release. Conclusions: Collectively, these results suggest that insulin resistance, but not steatosis, is associated with a heightened glycemic response to stress.

T-140-P
Plin2 Inhibits Cellular Glucose Uptake Through Interactions with SNARE Protein SNAP23
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Background: Although a link between excess lipid storage and aberrant glucose metabolism has been recognized for many years, little is known what role lipid storage droplets and associated proteins such as perilipin 2 (Plin2) play in managing cellular glucose levels. Methods: The role of Plin2 in regulating glucose uptake by interacting with, and regulating cellular targeting of SNAP23 to lipid droplets. In summary, the current study for the first time provides direct evidence for the role of Plin2 in mediating cellular glucose uptake.

Conclusions: Hypoinsulinemia is a common factor found in the multiple medical disorders of the metabolic syndrome. Checking serum insulin levels in a primary care setting may prove to be an essential tool for early diagnosis and preventative care.
Knudsen, Thora B. Bodvarsdottir

**Background:** GLP-1 analogs, such as liraglutide, are used as a treatment of diabetes due to their ability to improve glucose-stimulated insulin secretion (GSIS) and lower glucagon levels which are inappropriately high in diabetics. However, clinical studies have shown that liraglutide can also cause significant weight loss, and liraglutide is currently in phase 3 clinical development. 

**Methods:** The purpose of this study was to determine the efficacy of liraglutide for weight loss in obese monkeys (n=7) chronically maintained on calorically dense food. These findings indicate rs17087518 may have a role in a relatively reduced predisposition to T2DM, currently, genetic information is not incorporated for the assessment of risk to T2DM. We used Whole Genome Regression methods to predict diabetes status of 5,245 subjects from the Framingham Study.

**Results:** Food intake was transiently affected by liraglutide, with a peak reduction of 56% and a 30% reduction at the 12-week time point. Consistent with clinical studies, animals reduced bodyweight by 10% on average, although this was highly variable, with peak weight loss ranging from 0% to 15%. The weight loss was solely due to loss of fat mass. Not surprisingly, liraglutide also increased GSIS during the first two months of treatment, with an average peak increase of 82% while improving HbA1c levels surprisingly, liraglutide also increased GSIS during the first two months of treatment. This transient effect is likely secondary to the improved insulin sensitivity as GSIS dropped to 38% below pre-treatment levels similar to pre-treatment. This transient effect is likely secondary to the improved insulin sensitivity as GSIS dropped to 38% below pre-treatment levels after cessation of liraglutide treatment.

**Conclusions:** These studies suggest that liraglutide has beneficial effects on weight loss, primarily through inhibition of food intake, even in animals consuming palatable and calorically dense food.

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**T-144-P**

**Genome-Wide Association Study to Identify Variants Influencing Energy Expenditure and Predicting Body Weight Change in American Indians**

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**Background:** Lower rates of energy expenditure (EE) have been associated with future weight and fat mass gain. Prior studies have shown that BMI has a heritable component but the specific genes that affect EE remain to be elucidated.

**Methods:** Genotypic information on 435,148 SNPs from a prior genome-wide association study was available for 291 healthy American Indians (160M, age: 28±6y, BMI: 34±8kg/m2, body fat: 33±8%) who had a measure of RMR obtained with indirect calorimetry (ventilated hood system), and also for 185 subjects (116M, age: 27±7y, BMI: 34±8kg/m2, body fat: 32±8%) with measures of 24h EE in a whole room calorimeter. Longitudinal data for weight in the two groups were available after a median follow-up time of 7.8 and 7.4 years, respectively. The association of genotypes with the residual variance of RMR and 24h EE after adjusting for known physiologic covariates, and with the rate of weight change (RoWC) was assessed by linear regression analysis.

**Results:** Two variants (rs10507100 and rs17087518) were identified that had nominal associations with both adjusted EE measures and RoWC in opposing directions (all P<0.05), but only rs17087518 remained associated with maximum BMI recorded from a non-diabetic exam in a larger sample of 937 subjects (37.8, 36.3 and 32.1 kg/m2 for G/G, G/C and C/C, respectively, P=0.02). Subjects homozygous for the non-risk allele combined). 

**Conclusions:** We previously found significant differences in abdominal, visceral and liver fat distribution between white (EA) and Japanese American (JA) women of comparable total adiposity. We have now examined their genome-wide blood leukocyte methylation. Methods: Sixty healthy EA or JA women, aged 60-65, underwent dual energy X-ray absorptiometry (DXA) for estimation of total fat (TF) and regional fat and provided a fasting blood sample; 46 of them also underwent abdominal magnetic resonance imaging (MRI) for visceral, subcutaneous, and liver fat estimation. Leukocyte DNA samples were analyzed with the Illumina HumanMethylation450 BeadChip, and methylation differences between JA (N=30) and EA (N=28) were evaluated using a multivariable analysis, adjusted for age, assay batch and TF. Results: We found 293 significantly differently methylated (DM) loci comparing JA vs. EA (p<1.27E-07). Of these, 20 DM loci (11 hypermethylated in JA, 9 hypermethylated in EA) showed ≥20% differences (median delta-beta ≥ 10.2). The top DM loci were located within genes (n=12 loci in 11 genes) or in intergenic regions (n=8). In Ingenuity Pathway analysis, the 11 genes were most associated with the network function of energy production and endocrine system (score or –log(p) of 33), including 5 genes involved in lipid and/or carbohydrate metabolism (CAC1A, DECR2, SLC27A1, UGT2B15, UGT2B17). The DM locus in SLC27A1 was associated with subcutaneous fat (r=0.47, p=0.009) in EA only. Conclusions: Our findings suggest that leukocyte DNA methylation profiles may differ by ethnicity. In our comparison of EA and JA women, the differences found were in loci involved in energy metabolism.
T-147-P
Simplified WBC Type-Specific Isolation for Epigenetics on Obesity
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Background: Epigenetic reprogramming is proposed to account for many of the long-term negative health related conditions associated with obesity. The majority of the published information on the epigenetic changes associated with obesity comes from studies using tissues containing a mixture of cell types. However, utilizing single cell types for these epigenetic studies is crucial because each cell type is anticipated to have different and contrasting DNA cytosine methylation patterns. Blood leukocytes are a good source of DNA to study epigenetic changes that are associated with obesity, yet the total white blood cells are comprised of seven major cell types that differ in the methylation of 8% to 40% of the 485,000 methyl C residues examined.

Methods: Combining several common approaches we developed simplified protocols using magnetic beads to isolate a few to all of the seven different white blood cell types from fresh whole blood with and without the use of a red blood cell lysis, respectively. Results: From fresh or frozen whole blood without red blood cell lysis CD4+ T cells, CD8+ T cells and CD14+ Monocytes may be isolated in a few hours. From fresh whole blood following red blood cell lysis (CD4+ T cells, CD8+ T cells, CD14+ monocytes, CD16+ neutrophils, CD19+B cells, CD56+ Natural Killer cells and Siglec-8+ eosinophils) all seven cell types were successfully isolated. Working with frozen cells is especially helpful in obtaining samples from a variety of clinics regardless of the distance, including rural areas, to the laboratory. Attempts to isolate each white cell types after storage in formaldehyde have not yet been successful.

Conclusions: Initial results suggest that cytosine methylation patterns in bisulfite treated DNA from these cells may be examined directly by a nested PCR sequencing protocol.

T-148-P
Association of BMI, 8 SNPs Reported to Be Related to Gout Phenotype and Their Interaction in Gout Incidence in Framingham Heart Study
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Background: We aim to assess the association of 8 serum urate SNPs and BMI and their interactions with incident gout in a population-based cohort study. Methods: We used the Framingham Study including subject from the Original and the Offspring cohort (N=4,967). We assessed the effect of 8 SNPs in the recently described genetic urate score on incident gout. Subjects were genotyped with Affy500k platform, and two of the SNPs associated to gout rs1165196 and rs1036766 were present in that platform. The SNPs rs1967017, rs780093, rs13129697, rs1999936, rs675209 and rs2078267 were not present in the Affy SNP array, thus we imputed them with IMPUTE2. BMI was taken at the time of gout or, at the time of censoring if the subject is healthy or died without gout. We fitted logistic regression models to assess the associations. Estimated effects in the liability scale, odd ratios, and p-values were reported for all SNPs, covariates, and interactions. 406 patients had incident gout (74% males), with 169 from the FHS original cohort and 293 from the Offspring cohort. Results: In a model with main effects of BMI and SNPs, three of eight SNPs and BMI were significantly associated with incident gout (p<0.008 for all). Zero SNPs showed significant main effects on gout in the model that adjusted for all BMI*SNP interaction terms. However, BMI remained significant (p<0.009) in all models.

Conclusions: SNPs known to predict urate levels moderated the association of BMI with gout, suggesting the possibility that the extent to which BMI increases the risk for gout may depend on a person’s a priori genetic risk for high urate levels.

T-149-P
Mouse Niemann-Pick C1 Haploinsufficiency Responsible for Obesity or Diabetes Depends on Genetic Background
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Background: A number of genome-wide association studies have shown that the Niemann-Pick C1 (NPC1) gene is associated with obesity in various populations. It has also been reported that the NPC1 gene is associated with type 2 diabetes independent of body weight. These seemingly contradictory reports suggest that the NPC1 gene may interact with undefined modifying genes and certain environmental factors to manifest these disparate metabolic diseases. We previously performed growth studies using BALB/cJ Npc1 normal (Npc1+/+) and Npc1 heterozygous (Npc1+/-) mice and confirmed that decreased Npc1 gene dosage and protein function interacts with a high-fat diet to promote weight gain and adiposity. Importantly, the follow up studies performed using hybrid BALB/cJ and C57BL/6J mice confirmed the weight gain but also metabolic features associated with type 2 diabetes.

Methods: We have now performed additional studies using a novel C57BL/6J Npc1 mouse model produced by backcrossing the BALB/cJ null mutant into the C57BL/6J background for over 20 generations. Results: The results indicate that C57BL/6J Npc1+/- mice, but not BALB/cJ Npc1+/- mice, have impaired glucose tolerance when fed a low-fat diet and independent of body weight. When fed a high-fat diet, the C57BL/6J Npc1+/- mice did not show any difference from Npc1+/- in regards of weight gain or diabetes, likely due to a masking effect of susceptibility due to this genetic background strain developing obesity and diabetes. Conclusions: Therefore, decreased Npc1 gene dosage among two different mouse genetic backgrounds interacts with undefined modifying genes to manifest disparate yet often related metabolic diseases.

T-150-P
Insulin Resistance as an Independent Predictor of Abnormal Cardiac Structure and Function in Severely Obese Adolescents
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Background: We follow a population of severely obese adolescents seeking bariatric surgery who demonstrate increased rates of insulin resistance, pre-diabetes, dyslipidemia, and hypertension. We hypothesized that insulin resistance in this population would be associated with abnormal cardiac structure independent of weight status. Methods: We conducted a cross-sectional study of 66 patients enrolled from 2007 to 2012 in an FDA-approved study of the LAP-BAND®. At study entry we obtained anthropometric measures, blood pressures, metabolic lab studies, and echocardiogram parameters of the left ventricular mass (LVM), left ventricular posterior wall dimension (LVPW), left ventricular internal dimension (LVID), and shortening fraction (FS). We adjusted for adiposity by indexing LVM by BSA (LVM-BSA) and calculating relative wall thickness [RWT = (LVPW+LVID)/LVID]. Linear regression analyses were performed to determine if blood pressures or metabolic lab values predicted echo values, controlling for BMI. Results: The majority of our cohort was female (88%) and Caucasian (82%). Mean age of 16 years and mean BMI of 50.3 kg/m² (SD 7.3). 21.9% of patients had an abnormal LVM-BSA, RWT, or FS. Results of the regression indicated that only HOMA-IR significantly predicted LVM-BSA [F(5,5) = 2.71, p < 0.05, adjusted R2=0.140, [β=-0.40] and RWT [F(6,5) = 3.11, p < 0.05, adjusted R=0.40, [β=-0.29]. HOMA-IR was also the only significant negative predictor of FS [F(5,5) = 0.05, adjusted R2=0.138, [β=-0.36].

Conclusions: Cardiac structure and function abnormalities, which are precursors to heart failure, were present in nearly a quarter of severely obese adolescents in our study and were associated with insulin resistance independent of weight status and other cardiovascular risk factors.

T-151-P
Effect of Lycopene and Exercise in Cardiovascular Parameters in Obese Hypoestrogenic Wistar Rats
Patrick Mailloix-Salinas, Beatriz Guillen-Garcia, Juventino Colado-Velazquez, Jose V. Espinosa-Juarez, Osmar A. Jaramillo-Morales, Guadalupe Bravo Mexico, Mexico

Background: Hormone deficiency causes physiological alterations exacerbating problems caused by obesity in the cardiovascular system. Exercise improves cardiovascular function and reduces body weight. In this study we test the effect of lycopene-rich tomato extract with antioxidant activity and exercise in cardiovascular parameters in obese Wistar rats with hypoestrogenism. Methods: Female Wistar rats were randomized in 4 groups (n=8) and were subject to bilateral ovariectomy. The animals were given hypercaloric diet (30% sucrose in drinking water) and standard laboratory chow ad libitum for 32 weeks. After this period, treatment with lycopene-rich extract (5 mg/kg/day) or vehicle (corn oil) was performed; animals were subject to exercise regimen on a treadmill at speed of 10 cm/s for 20 min with speed in
creases each week up to 30 cm/s for 4 weeks. Mean arterial pressure (MAP) was measured, the animals were sacrificed, organs were excised and blood was sampled to perform biochemical and oxidative stress assays. Results: Administration of the extract significantly increased body weight of animals without significantly reducing it. MAP was significantly higher for vehicle group compared to the exercise and vehicle-exercise groups, and only a trend in decrease of LDLc was observed for the lycopene-exercise group. Nitrite levels were significantly increased in vehicle group, treatment with extract significantly reduced them as well as exercise. Lipid peroxidation was significantly higher in vehicle groups and was significantly reduced in treated and exercise groups. Conclusions: Our data shows the beneficial effect of exercise in improving cardiovascular health. Consumption of natural antioxidants in the diet can enhance this effect hereby reducing the risk of developing cardiovascular disease.

T-152-P
Differential Response in Aortic Stiffness to Acute Exercise Is Not Influenced by Central Blood Pressure in Obese Versus Normal Weight Individuals
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Background: Obesity is sometimes, but not always, associated with altered resting blood pressure (BP) and arterial function. Acute exercise hemodynamics are also altered in obesity. BP affects many components of arterial function and little data exists on the effects of acute exercise on arterial function for obese persons. Purpose: To determine the effects of an acute bout of exercise on arterial function in obese versus healthy weight individuals.

Methods: Young (23 yr), lean (n=38, BMI=22.3 kg/m2) and obese (n=20, BMI=34.0 kg/m2) individuals had arterial measurements obtained at rest, and 15 and 30 min following a maximal bout of aerobic exercise. An arterial tonometer was used to obtain aortic BP, as well as measures of arterial stiffness (augmentation index (Alx75), central and peripheral pulse wave velocity (PPW)).

Results: The obese group had higher resting diastolic BP (68 vs. 75 mm Hg), but systolic and mean BP were similar between groups. Central arterial stiffness (PPWV and Alx75) increased following exercise in the obese (PPWV: rest 5.84, 15-min post-ex 5.61, 30-min post-ex 5.16 m/s; Alx75: rest 1.23, 15-min post-ex -0.61, 30-min post-ex 5.72%), with no change in the lean (PPWV: 5.67, 15-min post-ex 5.46, 30-min post-ex 5.35 m/s; Alx75: rest -0.08, 15-min post-ex -0.78, 30-min post-ex -6.17%). Peripheral stiffness was not affected by obesity. Conclusions: In this young cohort of obese and lean individuals associated with increased central arterial stiffness, independent of BP. This pressure independent increase in arterial stiffness in response to physical stress in obese individuals may be a function of oxidative stress and decreased nitric oxide bioavailability. Future work is needed for clarification.

T-153-P
No Effects of Postprandial Increase in Plasma Lipids on Flow-Mediated Vasodilation in Healthy Young or Older Subjects
Christos S. Katsanos, Christian Meyer, Lawrence J. Mandarino, Guilherme Puga Scottsdale, AZ

Background: Ingestion of a high-fat meal has been shown to impair endothelial vascular function, a response linked to an increased risk for cardiovascular events. This postprandial impairment in the endothelial vascular function has been attributed to increases in plasma lipids, particularly triglycerides (TG) and free fatty acids (FFA). Methods: We assessed endothelial vascular function by flow-mediated dilation in 7 young (age: 23 ± 1 yr, body fat: 18 ± 2%, mean ± SE) and 6 older (age: 67 ± 1 yr, body fat: 27 ± 1%) apparently healthy subjects in the postabsorptive state and 4 hours after ingestion of whipping cream (0.7 g fat/kg body weight). Peak forearm blood flow (PFBF) response was determined 15 sec after 5-min arterial occlusion using venous occlusion strain-gauge plethysmography. Results: Plasma TG and FFA concentrations increased throughout the 4-hour postprandial period in both groups (P <0.05), with no differences in the overall response between the young and older subjects (P >0.05). ANOVA indicated no main effect for whipping cream ingestion on PFBF (P >0.05). There was a main effect for age on PFBF. Older subjects had a significantly lower PFBF (ml/100ml/mm) compared to the young subjects in the basal period (T 4.0 ± 0.9 vs 10.7 ± 0.7; P <0.05), but not in the postprandial period (9.3 ± 1.7 vs 11.2 ± 1.7; P >0.05). PFBF in the postabsorptive state across subjects was inversely correlated with the percent body fat (r = -0.604, P <0.05), but not with the concentrations of plasma lipids (P >0.05). Conclusions: We conclude that postprandial increases in TG and FFA, per se, do not impair flow-mediated dilation in either young or older individuals. When considered across individuals, percent body fat correlates with flow-mediated dilation in the fasting state.

T-154-P
Obesity with Metabolic Dysfunction Demonstrates Early Signs of Nephropathy in Nonhuman Primates
Sadaf Aslam, Sufia H. Khan, Ellen Linden, Jennifer D. Newcomb, Barbara C. Hansen Tampa, FL

Background: The complication of obesity that is least likely to be cited and is recognized is nephropathy or glomerulosclerosis, possibly due to its usual attribution to diabetes. In the present study we extended our prior identification of early histopathological changes in obese-prediabetic monkey kidneys with an investigation of the physiological biomarkers of obesity-related nephropathy. Methods: Obese monkeys that were metabolically normal (OB-Norm; 13.4±0.6 kg, N=22) were compared to similarly overweight obese dysmetabolic monkeys (with metabolic syndrome)OB-Dysmet; 14.3±0.5 kg, N=29). Renal function measurements included albumin excretion rate (AER), glomerular filtration rate (GFR), and the blood urea nitrogen/creatinine ratio (BUN/Cr) together with a range of new exploratory biomarkers of early nephropathy. Results: The OB-Dysmet group had a significantly higher AER than the OB-Norm group (63.6±19.8 vs 11.1±4.0, P=0.002), and a significantly higher BUN/Cr ratio (23.2±2.0 vs 15.2±0.8, P=0.0016). Furthermore, the GFR in the OB-Dysmet group was significantly higher than in the OB-Norm group (80.2±6.2 vs 66.5±4.5, P=0.042), indicating early hyper filtration presumably preceding the decline in GFR seen in type 2 diabetes. Fasting plasma glucose was significantly elevated in the OB-Dysmet group relative to the OB-Norm (74.7±3.5 vs 63.9±2.2, P<0.008), although still normal. Conclusions: This study of renal physiology in obesity, indicates that early signs of developing glomerulosclerosis can be identified clinically in the subgroup of the obese who show the features of the metabolic syndrome. Thus, nephropathy should be considered a common complication of obesity. The presence of hyper filtration observed in the obese dysmetabolic group identified a target population for further investigation of the range of new urinary biomarkers.

T-155-P
Metabolic Effects of Overexpression vs. Inactivation of Adipose Tissue Angiotensinogen
Monique J. LeMieux Lubbock, TX; Randall Myatt Baton Rouge, LA; Nishan S. Kupahama Peradentaya, Sri Lanka; Naima Moustaid-Moussa Lubbock, TX

Background: The adipose tissue Renin Angiotensin System (RAS) has been linked to the pathogenesis of metabolic syndrome. We have previously shown that overexpression of the RAS precursor, Angiotensinogen (Agt) in mouse adipose tissue (Agt-TG) increased insulin resistance and adipose and systemic inflammation. In order to further understand the role of adipose Agt in metabolic disorders, we generated adipose specific Agt knockout (Agt-KO) mice, using the cre-loxP system. Methods: Agt-KO and control litter mates were fed either a low-fat (LF) or high-fat (HF) diet to assess metabolic differences. Agt expression was specifically knocked down by 80% in both white and brown adipose tissue (WAT, BAT) of the Agt-KO mice, using the cre-loxP system. Methods: Agt-KO and control litter mates were fed either a low-fat (LF) or high-fat (HF) diet to assess metabolic differences. Agt expression was specifically knocked down by 80% in both white and brown adipose tissue (WAT, BAT) of the Agt-KO mice. Results: Transgenic Agt-TG mice fed a LF diet exhibited obesity, insulin resistance and glucose intolerance. By contrast, most metabolic parameters (body weight, glucose and insulin tolerance) were comparable between the wild type (WT) and Agt-KO littermates in both LF and HF diet-fed groups. Preliminary gene expression results indicated alterations in angiogenesis and insulin signaling in the Agt-KO mice fed LF diets when compared to the WT mice. Furthermore, MCP1 gene expression was downregulated in the Agt-KO vs. the WT littermates. Conclusions: In conclusion, despite the lack of an obvious phenotype in adipose Agt deficient mice, these cellular and molecular changes are consistent with previously reported findings of RAS in insulin resistance, angiogenesis and inflammation.
In conclusion, our data provide evidences that between groups. The TG level was higher in HF (79 ± 5 mmHg) compared to C (40 ± 3 mmHg), and Hexamethionium in HF (-47 ± 2 mmHg) when compared with C (-31 ± 5 mmHg), but significant increase after L-NAMe in HF (70 ± 8 mmHg) when compared with C (35 ± 9 mmHg). Conclusions: Our results suggest that neurogenic and hormonal alterations are contributing to increase the BP in obesity model induced by chronic administration of a high-fat diet, after weaning.

T-156-P
Evaluation of Neurogenic and Humoral Factors in Rats with Diet-Induced Obesity
Anna Laura V. Américo, Ana Paula D. Leite, Tâtila S. Higa, Fabiana S. Evangelista, Vera Farah, Patricia Fiorino São Paulo, Brazil

Background: The obesity and hypertension have been considered risk factors for cardiovascular disease. Therefore, it is very important to study the mechanisms regulating blood pressure. The aim of this study was to evaluate the neurogenic, sympathetic nervous system (SNS), and humoral, angiotensin II (ANG II), nitric oxide (NO), factors in the control of the blood pressure (BP) in obesity rats. Methods: Male Wistar rats were separated in groups control (C, n=8) fed with normocaloric diet and high-fat diet (HF, n=8) with increased lipids in 30% during 8 weeks, with starts immediately after weaning. The animals were instrumented with arterial and venous catheters to assess blood pressure (BP) and heart rate (HR) signals. BP was recorded by 15 minutes and after inhibition pharmacological of ANGII (Losartan,10mg/kg), NO (L-NAME, 10mg/kg) and the SNS (Hexamethionium, 40mg/kg).

Results: The basal BP was increase in HF (118 ± 2 mmHg), when compared with C (105 ± 3 mmHg), without changes in HR. The BP variation was significantly decreased after Losartan in HF (10 ± 3 mmHg) when compared with C (4 ± 3 mmHg), and Hexamehtionium in HF (4 ± 2 mmHg) when compared with C (3 ± 1 mmHg), but significant increase after L-NAMe in HF (70 ± 8 mmHg) when compared with C (35 ± 9 mmHg). Conclusions: Our results suggest that neurogenic and hormonal alterations are contributing to increase the BP in obesity model induced by chronic administration of a high-fat diet, after weaning.

T-157-P
Autonomic and Metabolic Dysfunction in Short-Term Experimental Obesity
Cynthia R. Muller, Ana Paula D. Leite, Tâtila S. Higa, Fabiana S. Evangelista, Vera Farah, Patricia Fiorino São Paulo, Brazil

Background: Obesity and the dyslipidemia have been associated with metabolic dysfunction and cardiovascular disease. The aim of this study was to evaluate the autonomic and metabolic functions in adult rats subjected to a high-fat diet. Methods: Adult male Wistar rats were separated in groups (n=8), control (C) fed with normocaloric diet and high-fat diet (HF) with increased lipids in 30%, followed by 21 days. Glucose tolerance test (GTT) was determined after glucose load injection (1.5g/kg i.p.), Blood Pressure (BP) and Heart Rate (HR) were directly recorded using Windaq. Cardiac autonomic activity was evaluated using pharmacological blockade (Atenolol, Atropine). Baroreflex sensitivity was assessed by HR responses to phenylephrine and sodium nitroprusside injections. Animals were euthanized through anaesthetic Sodium Pentobarbital. The blood was collected to evaluate the triglycerides (TG) through kits (Labtest, BR), and insulin and leptin were evaluated by RIA (Linco Research). The retroperitoneal fat pads were collected and weighted.

Results: There was no difference in the body weight between groups, the TG level was higher in HF (79±5mg/dl) then C (40±4mg/dl). There was glucose intolerance in HF (226±12AU) when compared to C (196±14AU). Insulin and leptin were 26% and 36% augmented in HF compared to C, respectively. The retroperitoneal fat pad was increased in HF (19±2g/Kg) compared to C (5±0.5g/Kg). The obesity did not change resting BP and HR but reduced bradycardic in HF (1.6±0.3Hz). HR showed evidence of development of vascular dysfunction prior to significant weight gain during fat loading. The animals were instrumented with arterial and venous catheters to assess blood pressure (BP) and heart rate (HR) signals. BP was recorded by 15 minutes and after inhibition pharmacological of ANGII (Losartan, 10mg/kg), NO (L-NAME, 10mg/kg) and the SNS (Hexamethionium, 40mg/kg). The basal BP was increase in HF (118 ± 2 mmHg), when compared with C (105 ± 3 mmHg), without changes in HR. The BP variation was significantly decreased after Losartan in HF (10 ± 3 mmHg) when compared with C (4 ± 3 mmHg), and Hexamehtionium in HF (4 ± 2 mmHg) when compared with C (3 ± 1 mmHg), but significant increase after L-NAMe in HF (70 ± 8 mmHg) when compared with C (35 ± 9 mmHg). Conclusions: Our results suggest that neurogenic and hormonal alterations are contributing to increase the BP in obesity model induced by chronic administration of a high-fat diet, after weaning.

T-158-P
Timed Fat Feeding in Rats Induce Diurnal Variation in Vascular Function
Israel Orta, LaShanni L. Butler, Joyce M. Richey Los Angeles, CA

Background: Recent evidence in mice, demonstrates that fat feeding restricted to 8 hours during the day, prevents obesity and its associated abnormalities. In light of these findings, we undertook the current study to examine the effects of restricted timed fat feeding on vascular function. Methods: Towards this end, male Wistar rats (n=10) with initial weights of 262±6.2 g were fed control (C, n=3) or 60% high fat (HF, n=2) diets either during the day (D) from 7am-7pm, (lights on) or during the night (N) from 7pm-7am, (lights off) for a period of 3 weeks (w). Body weight (BW) and food intake were measured bi-weekly and daily, respectively. For assessment of vascular function, thoracic aortae were isolated and cut into 3 mm rings and suspended in tissue baths with an optimal passive tension of 3 g for measurement of isometric tension. Results: Total caloric intake over the 3 w was 11% less in HF-D rats compared to HF-N, 1313 vs. 1166 kilocalories (p<0.001). BW increased significantly in all groups, but did not differ among groups: average weight at time of sacrifice (361 ± 23.4g; p<0.05 vs initial wt). Interestingly, 3 w of timed fat diet resulted in differential vascular responses to cumulative doses of PE were significantly reduced in HF-D rats, reaching only 28% of baseline compared to Con (=80% for both D and N) and HF-N (50%) (p<0.05 HF-D vs. Con). Conclusions: These data demonstrate evidence for development of vascular dysfunction prior to significant weight gain during fat loading. These data also show that fat feeding restricted to the day when rats are inactive, may have a more deleterious effect on vascular function.

Wednesday, November 13, 2013
Location: Exhibit Hall A

Intervention Studies - Behavioral-Pediatric
T-159-P
Using Technology to Deliver a Responsive Parenting Intervention to Promote Healthy Weight Gain in Toddlers: Which Components Seem Reasonable for Low-Income Mothers Participating in WIC?
Jennifer S. Savage, Kari C. Kugler, Leann L. Birch University Park, PA

Background: Without effective interventions, half of US children may be obese by 2030. Most interventions take the “kitchen sink” approach, including a combination of intervention components; however, it is unclear what combinations of components are optimal. This study examines the feasibility of delivering different types of intervention components, varying in content and mode of delivery, among a high-risk population enrolled in the Women Infant and Children (WIC) program. Methods: An initial pilot intervention included 122 mothers with toddlers enrolled in the WIC program who were randomized to one of three responsive feeding conditions: brochure, home visits, home visits plus mobile technology. Based on pilot findings, a feasibility study (N=100 dyads) was conducted using the multiphase optimization strategy (MOST). Mothers were randomized to receive 1 to 8 interventions components (e.g., feeding practices, meal/snack frequency, responsive parenting, goal setting, tailored messages, etc.) blocking on maternal depression. Assessments occurred at 1 and 6 months post intervention. Results: Nearly two-thirds of mothers viewed the video messages and 84% intended to use the information. Mothers who received video messages were significantly less likely to use food to soothe or manage behavior and a forceful feeding style than those receiving handouts only. Data on the feasibility of delivering different combinations of components, based on participant and staff satisfaction, will also be presented. Conclusions: Results from the initial pilot study show promise, suggesting that technology can be used effectively to change parent feeding behavior among this low-income population. The merits of using a more efficient experimental design that includes technology with hard-to-reach populations will also be discussed.

T-160-P
Cost Effectiveness of Family-Based Treatment for Child and Parental Obesity
Leonard H. Epstein, Rocco A. Paluch, Brian Wrotniak, Tinuke O. Daniel, Colleen K. Kilanowski Buffalo, NY; Denise E. Willfey St. Louis, MO; Eric Finkelstein Singapore, Singapore

Background: Obesity runs in families, and family-based treatment (FBT) is associated with significant weight loss in obese children and their parents. Yet, many pediatric obesity treatments focus on the child, either by intervening directly on the child, or by teaching the parent to be the agent of change. FBT may offer cost-savings as one treatment creates effects in both child and parent, eliminating the need for separate treatments. The objective of the present study was to compare the cost-effectiveness of FBT compared to
treated the obese parent and child separately. **Methods:** Fifty
overweight/obese 8–12 year-old children with overweight/obese parents were randomly assigned to a 12 month FBT or a similar treatment program that separately treated parents and children (PC). Between group differences in payer costs, participant costs, and societal costs were used to compare cost effectiveness between groups using one-way analysis of variance. **Results:** Intent to treat analysis showed significantly lower costs per family were observed for FBT than PC for payer costs ($842.78 ± 146.31 vs $1005.94 ± 140.27; F(1,47) = 15.86, p < 0.001), participant costs ($610.49 ± 238.5 vs $842.78 ± 338.89; F(1,47) = 59.65, p < 0.001) and societal cost per family ($1,453 for FBT and $2,261 for PC, p < 0.001). At 12 months, FBT parents lost 12.7 lbs. and FBT children lost 7.5 percent overBMI units. PC parents lost 7.7 lbs. and PC children lost 3.7 percent overBMI units. **Conclusions:** The data suggest that FBT is a more cost effective treatment for families with overweight children and parents. Given the high rates of obesity in both adults and children, FBT may provide a promising platform for obesity intervention that can treat children and parents simultaneously, facilitating effective resources utilization and significant impact.

**T-161-Pot**

**Participants in the MATCH Wellness Intervention Demonstrate Improved Weight Status After 4 Years**

Suzanne Lazarick, Xiangming Fang, Yancey Crawford, Lauren Needell, Alexis T. Baren, George T. Hardison, Greenville, NC

**Background:** Motivating Adolescents with Technology to Choose Health (MATCH) has been provided in low-income, high-risk, rural NC schools for 7 years. In 2009, MATCH was expanded in two intervention schools compared to one control school. We report 4 year results. **Methods:** In spring 2009, 7th grade teachers in 2 schools were trained and delivered the MATCH curriculum, while 1 school served as control. In 2013 students still enrolled in the district(s) were recruited for re-measure. Outcomes include: BMI Z-score, BMI %ile for age/gender and weight category. Wilcoxon rank test was used to compare measures at each follow-up between the MATCH and Control groups and linear mixed models were adopted to compare the overall trend in time between groups. **Results:** Participants were 68% black, 23% white, and over half were either overweight (OW) or obese (OB) at baseline. Of original participants, 104/189 (55%) MATCH and 117/173 (68%) control were re-measured, with no differences in gender, age or weight status of those retained. Among the all overweight (combined OW + OB) group at baseline and comparing control (C) to MATCH (M), respectively, the change in BMI Z score (C = 0.02, M = -0.07) and BMI %ile (C = -1.3, M = -5.1) differed more in the M group. In mixed models for both BMI Z score (p=0.0076) and BMI %ile (p<0.001), the MATCH group had a significantly downward trend that was significantly different than control. For changes in weight category: in C after 4 years, % Healthy Weight (HW) decreased (53% to 48%), % OW increased (17 to 18%), and % OB increased (29 to 34%); in the MATCH group the % HW increased (40% to 46%); % OB decreased more (37 to 31%), and % OB baseline was lower. **Conclusions:** School based wellness education integrated within standard curriculum in high risk adolescents can result in improved weight status and should be further explored.

**T-162-P**

**Weight Status and Temperament: Among Toddlers Enrolled in WIC, Higher Weight Status Is Associated with Lower Effortful Control and Lower Surgency**

Brittany L. James, University Park, PA; Jennifer S. Savage, Leann L. Birch, State College, PA

**Background:** Prior research has revealed that aspects of temperament, defined as individual differences in regulation and reactivity, are related to child weight status. However, very little research to date has examined these associations among high-risk populations, which is the aim of this study. **Methods:** 236 mothers with children 12-36 months old participating in the Pennsylvania Women Infants and Children (WIC) Program completed demographic information and the very short Early Childhood Behavior Questionnaire (ECBQ), which identifies three higher-order factors of temperament, surgency (SUR), negativity (NEG), and effortful control (ORC). Multiple imputation was used to address missing data. Maternal BMI and child weight and length were collected, and relations between temperament factors and child weight status were assessed. **Results:** Mothers were primarily white (71%) and overweight (mean BMI 29). 37% of toddlers were above the 85th percentile on WHO weight for length measurements. Confirmatory factor analysis of the very short ECBQ revealed a poor fit. A revised three factor model demonstrated acceptable fit indices after removing 15 items that did not load on any factor (SUR r = 0.73, NEG r = 0.71, ORC r = 0.66). Higher levels of toddler surgency and effortful control were significantly associated with lower toddler weight for length after controlling for maternal BMI. **Conclusions:** The ECBQ may serve as an acceptable measure of temperament in toddlers as young as 12 months. Associations between toddler weight status and temperament in this WIC sample are consistent with findings from lower risk samples, which points toward its potential use as a universal tool in identifying an early risk factor for childhood obesity.

**T-163-P**

**Impact of the Prenatal Maternal Diet on Children’s Liking and Intake of Vegetables at 4-6 Years**

Wendy M. Stein, Laural K. English, Stephanie N. Fennbach, Terri L. Cravener University Park, PA; Paula C. Chandler-Laney, Birmingham, AL; Kathleen L. Keller, University Park, PA

**Background:** Flavors from a mother’s diet during pregnancy are transmitted to her developing fetus. Prenatal maternal dietary habits may influence her child’s subsequent liking and intake of foods with similar flavor characteristics. Such foods might include bitter (e.g. broccoli) and sweet (e.g. carrots) vegetables. **Methods:** Secondary data analysis of 81 ethnically diverse children (mean ± SD age = 5.04 ± 0.77 y., BMI z-score = 1.0 ± 1.02) was used to explore the relationships between mothers’ reported intake of vegetables during pregnancy and children’s liking and intake of vegetables at 4-6 years. Children’s intake of vegetables was assessed with a parent-reported questionnaire and a laboratory mixed test-meal. Children’s liking of vegetables was measured using a 5-pt. Likert scale. BMI z-scores were calculated from children’s weight and height measured prior to the meal. Data were analyzed using bivariate correlations with and without controlling for parent-reported frequency of children’s vegetable intake at home. **Results:** Mothers’ reported intake of bitter vegetable positively correlated with children’s liking (r = 0.25, p < 0.04) and intake (r = 0.25, p < 0.03) of bitter vegetables. After controlling for children’s bitter vegetable intake at home, the association between mothers’ and children’s bitter vegetable intake remained significant (r = 0.28, p < 0.05). There were no significant associations between mothers’ reported intake of sweet vegetables and children’s liking (p = 0.26) or intake (p = 0.51) of sweet vegetables. **Conclusions:** The prenatal maternal diet may impact children’s liking and intake of vegetables, particularly vegetables with bitter flavors. This association may exist independently of children’s usual intake of bitter vegetables at home. These findings may be helpful for developing dietary interventions for children and their families.

**T-164-P**

**Motivational Interviewing and Adherence to Pediatric Obesity Treatment: Results from the MI Values Randomized Controlled Trial**

Melanie K. Bean, Priscilla Powell, Alexis Quinoy Richmond, VA; Karen Ingersoll Charlottesville, VA; Edmond P. Wickham, Suzanne E. Mazzeo Richmond, VA

**Background:** Poor treatment adherence and high attrition are notorious challenges in obesity treatments. Motivational interviewing (MI) may help address these concerns. MI Values is a randomized controlled trial of MI implemented as an adjunct to a multidisciplinary adolescent obesity treatment program (TEENS). We examined the effects of MI Values on TEENS attrition and adherence. **Methods:** TEENS participants who consented to MI Values (82%) were randomized to MI (n=58) or control (n=41). At weeks 1 and 10 of TEENS, MI participants engaged in 30-minute, individual MI sessions; control participants viewed health education videos. All participants continued with TEENS per protocol, which involved biweekly dietitian and behavioral support visits plus 3x/week of supervised physical activity. **Results:** In the MI group, % Attrition and adherence were measured and assessments completed at 3 and 6-months. T-tests and chi-square analyses examined group differences; control participants viewed health education videos. All participants continued with TEENS per protocol, which involved biweekly dietitian and behavioral support visits plus 3x/week of supervised physical activity. **Conclusion:** Results from the MI Values Randomized Controlled Trial yielded no significant differences in attrition and adherence between MI and control groups (p > 0.05). Treatment fidelity was high in both groups. **Conclusions:** Adherence to MI Values (N=99) was primarily African American (AA; 73%) and female (74%) with a mean age of 13.8 years. Mean body mass index percentile was 98.0. Compared to controls, MI participants had greater 3 month adherence to dietitian visits (OR = 1.61 vs. 1.01, 95% CI 0.40–5.55, p = 0.046) and behavioral support (OR = 1.53 vs. 0.93, p = 0.084) visits, and greater 6-month adherence to behavioral support visits (88% vs. 79%, p = 0.01)
activated by family/social reasons. They have better long-term weight loss, as compared to children who are less motivated. Findings highlight the importance of involving families in treatment decisions. A higher number of social/familial motives was associated with treatment completion (81.8%). Logistic and multiple regression analyses were calculated to examine the impact of treatment completion on social/familial motives.

The most frequent motivations endorsed by the children were: "I want to help my friend or family member lose weight," and "my family teases me about my clothes," "it was too difficult for me to get around," and "I want to have better safety of walking/biking to school." These behaviors were significantly more likely to report changes in weight-losing (61.5% to 92.3%; p<.001), counting calories (31.4% to 74.5%; p<.001), self-monitoring (26.9% to 82.7%; p<.001), decreased availability of chocolate candy in the home (1.9% to 15.4%; p<.01), decreased availability of cookies/cake in the home (3.8% to 21.2%; p<.01), eating a certain amount of calories (21.2% to 61.5%; p<.05), engaging in physical activity with my child (40.8% to 65.3%; p<.01). Scales were created based on the groups of parent behaviors. In a final model controlling for baseline BMI and treatment group, parent involvement and self-monitoring were both significant predictors of parent BMI post-treatment.

Conclusions: Results show that some parent weight control behaviors targeted in FBT change after treatment and impact parent BMI. Although FBT targets child obesity, parents may also experience direct benefit from participation, including practicing weight loss behaviors.

T-165-P Parent Behavior Change in Childhood Obesity Treatment
Abby Braden, David R. Strong, Kerri N. Boutelle La Jolla, CA

Background: During family-based treatment (FBT) for childhood obesity, parents are taught strategies including diet modification, physical activity, stimulus control, self-monitoring, and to engage in program related behaviors with their child. The current study evaluated changes in recommended behaviors by parents and parent BMI following FBT. Methods: Participants included 52 overweight or obese 8-12 year old children and their parents who completed a 5-month weekly FBT program as part of a randomized pilot study evaluating a parent-only treatment. Parent behaviors promoted by FBT (diet, physical activity, stimulus control, self-monitoring, parent involvement with child) were assessed at baseline and post-treatment by self-report. McNemar test evaluated significant differences in parent behaviors pre to post-treatment, and a linear regression evaluated impact on BMI. Results: After treatment, parents were significantly more likely to report changes in weight-losing (61.5% to 92.3%; p<.001), counting calories (31.4% to 74.5%; p<.001), self-monitoring (26.9% to 82.7%; p<.001), decreased availability of chocolate candy in the home (1.9% to 15.4%; p<.01), decreased availability of cookies/cake in the home (3.8% to 21.2%; p<.01), eating a certain amount of calories (21.2% to 61.5%; p<.05), engaging in physical activity with my child (40.8% to 65.3%; p<.01). Scales were created based on the groups of parent behaviors. In a final model controlling for baseline BMI and treatment group, parent involvement and self-monitoring were both significant predictors of parent BMI post-treatment.

Conclusions: Results show that some parent weight control behaviors targeted in FBT change after treatment and impact parent BMI. Although FBT targets child obesity, parents may also experience direct benefit from participation, including practicing weight loss behaviors.

T-166-P Child Motivations for Weight Loss: Influence of the Family
Abby Braden La Jolla, CA; Scott J. Crow Minneapolis, MN; Kerri N. Boutelle La Jolla, CA

Background: The impact of child motivation on treatment outcome among children enrolled in family-based treatment (FBT) for obesity has not been investigated. The current study evaluated weight loss motives among treatment-seeking, overweight children, and their relationship to treatment completion and outcome. Methods: Participants included 77 overweight children, aged 8-12, who were enrolled in a 5-month weekly FBT program as part of a randomized study evaluating a parent-only treatment. Motivation was assessed at baseline, and BMI was assessed at baseline, post-treatment, and 6-months post-treatment. Motivation of the child was assessed using a check-list of weight loss motives that were divided into two scales reflecting personal (“I want to do better at sports,” “I am tired of my weight,” “I feel bad about myself,” “I want to look better,” “I want to fit into different clothes,” “it was too difficult for me to get around,” and “I want to have better health”) and social/familial reasons (“Parent said I should,” “I saw a friend or family member lose weight,” and “my family teases me about my weight”). Results: The most frequent motivations endorsed by the children were “I want to look better” (84.4%) and “I want to have better health” (81.8%). Logistic and multiple regression analyses were calculated to examine the impact of motives on treatment completion and outcome. A greater number of social/familial motives was associated with treatment completion (p<.04) and a lower child BMI at 6-months post-treatment (p<.05).

Conclusions: Findings highlight the importance of involving families in child obesity treatment. Children who report motivations to lose weight because of social/familial influences may be more engaged in treatment and have better long-term weight loss, as compared to children who are less motivated by family/social reasons.

T-167-POT Developing and Piloting a Novel Culturally-Tailored Group Intervention for Multi-Ethnic Obese Adolescent Girls
Ida B. Thurston Memphis, TN; Kendrin R. Sonneville, Tracy K. Richmond; Boston, MA

Background: Obesity is common among adolescents and disproportionately affects Hispanic and African-American youth. Adolescent obesity is known to be difficult to treat, in part due to low patient engagement and high attrition rates. However, less is known about culturally appropriate treatments for obese youth. Methods: We conducted 3 focus groups of 12 overweight/obese males and females (ages 13-20) recruited from an urban adolescent primary care clinic. The semi-structured focus groups were designed to elicit ideas about the optimal obesity treatment approach. We then developed and piloted a group intervention among 5 adolescent females (ages 14-22; Mean BMI=48.9, SD=13.2) recruited from the PREP obesity program in the Division of Adolescent/Young Adult Medicine at Boston Children’s Hospital. Results: Guided by focus group feedback for an interactive, single-sex group intervention ran by non-medical providers, we designed a 6-week group intervention co-led by nutrition and psychology. The intervention was informed by motivational interviewing, mindfulness, and cognitive behavioral therapy techniques. Sessions included lessons about food quantity and quality, media literacy, hunger, mindful eating, weight-based stigma, body image, emotional eating, and coping with stress. Five female adolescents (3 Non-Hispanic Black, 1 Hispanic, 1 Non-Hispanic White) completed the interactive groups, which were well-received (4.9/5 satisfaction rating), well-attended (96% attendance), and resulted in weight loss (mean=−3.3kg, SD=6.6). Conclusions: Our interactive group intervention piloted among a multi-ethnic group of obese adolescent girls was highly acceptable, resulted in minimal attrition, and produced favorable changes in weight. Results underscore the importance of involving adolescents in the development of adolescent-targeted interventions.

T-167-POT Obesity, Dietary Intakes and Physical Activity Differ by Income Status in 5th Graders Participating in 5th Gear Kids
Michelle Cardel, Thirudur Gumnardottir, Jimikaye Beck, John C. Peters, James Hill. Denver, CO

Background: Low income children may be at greater risk for obesity, and the factors that influence this relationship remain unclear. Methods: We examined baseline health-related behaviors and perceptions by income status in children participating in 5th Gear Kids (SGK), a multi-level childhood obesity prevention program in 5th Graders. Participants included children from two school districts in Colorado (n= 6679; mean age 10.07). Anthropometrics were measured and health-related behaviors and perceptions were reported with a validated questionnaire in a sub-sample of children (n=3023). Free-reduced lunch (FRL) prevalence in each school was used to group schools into income levels (HIGH <33% FRL; MED 33-66% FRL; and LOW >66% FRL). Results: Overweight was significantly more prevalent in LOW when compared to HIGH (21% vs. 11.6%). Obesity rates, however, were significantly lower in LOW relative to HIGH (0.82% vs. 2.60%). Over 90% of the total sample reported eating healthy was important to them and no differences in fruit/vegetable intakes were observed. However, children from LOW consumed more fast food and sugar-sweetened beverages, and reported that even when they knew what the healthiest food was, they would pick it less when compared to HIGH (p<0.05). HIGH were more likely to report that physical activity (PA) was important to them and reported higher PA relative to LOW (p<0.05). Nevertheless, HIGH reported walking/biking to school significantly less than LOW and were more likely to perceive walking/biking to school as dangerous. Conclusions: Children from LOW were more likely than HIGH to be overweight but not obese. Overall, LOW reported a higher prevalence of many diet and PA behaviors typically associated with obesity, but differed in their perceptions of PA-related behavior, including perceived safety of walking/biking to school.
T-169-P  Acceptability and Feasibility of the Feeding, Families and Fun Intervention for Reducing Solid Fat and Added Sugar Intakes among Low-Income Preschoolers


Background: Solid fats and added sugar (SoFAS) intakes among preschoolers well exceed recommendations and contribute to child obesity, but have not been explicitly targeted in prevention efforts, particularly in high-risk populations. The objectives were to evaluate the feasibility and acceptability of Feeding, Fun, and Families (FFF), a behavioral and nutrition intervention for low-income mothers of preschoolers aimed at reducing SoFAS intakes by emphasizing portion size and authoritative child feeding strategies.

Methods: FFF was pilot tested in a single-arm, 12 wk group intervention emphasizing facilitated discussion via a trained moderator. Behavioral change principles (e.g. problem solving, goal setting) were used to address child feeding (i.e. structure, limit setting) and nutritional targets relevant to child SoFAS intake (e.g. snacking, portion size). Participants were 9 predominately African American mothers of preschoolers recruited through Women, Infant, and Children offices. Program acceptability/feasibility were assessed by maternal self-report and by the completion of pre-/post-intervention measures: child SoFAS intakes (3, 24 hr dietary recalls), mother-child meal observations. Results: Of 9 dyads, 8 mothers and 3 children were either overweight or obese. Attendance was high (7 of 9 mothers attended ¾ of sessions) and program targets appeared feasible (7 of 9 mothers reported no difficulty making changes). Approximately 60% of dietary recalls were completed and 8/9 mothers completed pre-/post- questionnaires, observational, and anthropometric assessments. Program acceptability was high (8 of 9 mothers rated as very/extremely helpful). Conclusions: Results provide initial evidence of feasibility and acceptability of FFF to reduce child SoFAS intakes through authoritative approaches to child feeding.

T-170-P  Effectiveness of a Family-Based Group Treatment: Two Year Outcomes of PHIT Kids

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Background: Comprehensive and multidisciplinary programs are recommended for pediatric weight management (Barlow and the Expert Committee, 2007). While the short-term effects of such programs have been closely examined, additional investigation of long-term outcomes is needed.

Methods: 155 youth aged 9 to 18 years with a BMI over the 95th percentile enrolled in PHIT Kids, a multidisciplinary weight management program at a Midwest children’s hospital. The program targets family-based lifestyle changes in an ethnically diverse, primarily inner-city population through classes offered in English and Spanish. Active treatment consists of 24 weekly sessions, followed by monthly maintenance visits for a total of 2 years. Child anthropometric data were measured at 6 time points throughout active treatment and maintenance, and children eligible to have completed all time points were included in a multi-level model analysis examining change over time in BMI z-scores. Results: Reductions in BMI z-scores were seen over the course of treatment (t = -2.4, p < .001), and average BMI z-score decreased from 2.36 (SD = 33) at baseline to 2.21 (SD = 34) at post-treatment (24 weeks). No significant change in BMI z-score was found between post-active treatment and 24 months (t = -.011, p = .92; M = 2.24, SD = 44). However, only 15% of children completed both treatment and 24 month follow-up.

Conclusions: Children attending PHIT Kids showed reductions in BMI z-scores during active treatment participation and maintained these changes at 24 months, suggesting that hospital-based multidisciplinary pediatric weight management programs may have long-term effects on child health. However, the ability to understand long-term outcomes is hampered by attrition in long-term follow-up studies. Future efforts should focus on increasing long-term enrollment in treatment outcomes studies.

T-171-P  Recruitment Response Rates for a Parent-Based Healthy Lifestyle Intervention for Head Start Preschoolers

Bethany J. Gaffka, Jennifer Hahn, Julie C. Lumeng, Niko Kaciroti, Karen E. Peterson Ann Arbor, MI

Background: Little is known about recruitment for parent-based preschool obesity intervention & prevention programs. The objective of this study was to examine response rates, by child weight status, to a recruitment flyer distributed to Head Start parents advertising the opportunity to participate in a group program to develop healthy eating & activity habits for their child.

Methods: Parents of 850 Head Start preschoolers were invited via recruitment flyers to participate in a 10-week parent group to learn how to develop healthy eating & activity habits for their young children. Parents provided consent to release height & weight collected by Head Start at the beginning of the school year to determine eligibility. Weight status was determined using CDC guidelines based on sex- and age-specific reference data. Chi square statistics were calculated to assess differences in response rate for parents of obese/overweight vs. normal weight children. Results: Weight status of the 850 children who received recruitment flyers is as follows: 18% obese, 16% overweight, 61% normal weight, and 5% underweight. 22% of parents consented to be screened for eligibility and the weight status of these children is as follows: 17% obese, 16% overweight, 66% normal weight, and 5% underweight. There were no significant differences in response rates for parents of obese/overweight vs. normal weight children (p = .63). Conclusions: Similar response rates to a flyer recruiting parents to participate in a parent-based group for developing healthy eating and activity habits were observed for parents of obese, overweight, and normal weight children. Given that low-income children are at higher risk for obesity, the rate of interest across weight status groups is encouraging and may represent a group of parents who may benefit from an obesity prevention or intervention program.

T-172-P  Exploring the Role of Parents in Pediatric Weight Management Treatment: Parent and Youth Perspectives

Bethany J. Gaffka, Susan J. Woolford Ann Arbor, MI

Background: It is widely accepted that parental involvement in pediatric weight management programs leads to greater improvements in child weight status compared to treatment programs that do not have parental participation. The objective of this study was to better understand parent and youth perceptions of the role of parents in youth weight management efforts.

Methods: Obese youth and their parent were invited to participate separately in a 30-minute telephone interview within 2 weeks of their initial visit to a multidisciplinary weight management center. One of the interview questions asked parents and youth to describe the specific types of things parents should be primarily responsible for doing to help their child achieve a healthy weight. Interviews were recorded and transcribed verbatim, and 7 major themes were identified. Kappas were calculated to assess for parent-child agreement for discussing the same themes. Results: Twenty-eight parent-child dyads completed the interview. The majority of youth (mean age = 12.7 ± 2.4 years; mean BMI = 37.6 ± 7.5) interviewed were female (61%) and covered by commercial insurance (60%). The top 3 themes parents described needing to take primary responsibility for were: grocery shopping (71%), encouragement to exercise (70%), and portion control (36%). The top 3 themes youth wanted their parents to take responsibility for were: grocery shopping (57%), encouragement to exercise (36%), and assistance with dining out (32%). Agreement for parent-child dyads was non-significant for all 7 major themes. There were no age or gender differences. Conclusions: These results suggest that within dyads there is significant disagreement about what types of things parents should do to assist their child with achieving a healthy weight.

T-173-P  A Culturally Adapted Family-Based Treatment Program for Overweight and Obese Mexican-American Children

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Background: Latinos and their children have been disproportionately affected by the high prevalence of overweight and obesity in youth. Recent studies suggest that 42% of Latino children aged 6-19 are overweight or
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For author conflict of interest information, see page S264

### T-174-P

**Impact of a Psychological Diagnosis on Changes in Health Indicators in a Clinical Pediatric Weight Management Program**

**William Stratbucker, Jared Tucker, Kyle E. Culver, Adelle M. Cadieux Grand Rapids, MI**

**Background:** Research evaluating the impact of psychological diagnoses on pediatric obesity treatment outcomes is limited. There is some evidence to suggest that youth who are referred to a weight management program are more likely to have psychopathology. This research examines the relationship between diagnosed psychological disorders and changes in health indicators during pediatric weight management treatment. **Methods:** Participants included obese youth (~59% female; age = 10 (1.35); BMI% = 97.3 (1.9)) and their parents (~91% female; BMI=30.5 (6.3); 52% work in home) participated in treatment. Participants reported high acceptability and liking of the treatment program and its primary components (i.e. ~86% parents “liked a lot” or “loved” it; ~95% would recommend to other families; ~85% felt program helped child have more control over eating). Pre-post changes in child BMI-Z and parent BMI scores approached significance (child BMI-Z change = -.07, p < .10; parent BMI change = -.4, p < .09). **Conclusions:** Culturally-adapted FBT is a feasible and well accepted treatment for Latino children, with the potential to improve weight loss outcomes.

### T-175-P

**Relationship among Psychological Disorders, Body Composition and Aerobic Fitness in Obese Youth**

**Jared Tucker, Adelle M. Cadieux, Kyle E. Culver, William Stratbucker Grand Rapids, MI**

**Background:** Childhood obesity increases the risk of adverse psychological and physical wellbeing. However, the relationship between psychological disorders, health indicators, and health behaviors among obese youth is not well understood. The purpose of the current study was to assess differences in anthropometry, physical activity, and aerobic fitness among obese children either with or without a diagnosed psychological disorder. **Methods:** Participants included obese youth (~59th percentile for BMI) who were enrolled in a multi-disciplinary weight management program. Anthropometric measures included height, weight, body composition, and waist circumference.

Obese. Cultural differences and responses to traditional family-based behavioral treatment (BFT) suggest the need for interventions designed specifically for Latino families. **Methods:** We developed and pilot-tested a culturally-sensitive FBT program for Latino families. Focus groups were conducted with 41 Latino families in the developmental stages of treatment formation to obtain qualitative information on how behavioral weight loss techniques could be tailored to be more culturally suitable. Based on this information and existing literature, a 12-session treatment protocol was developed by adapting traditional FBT. Adaptations included Spanish translation, culturally-tailored activities, and diet modifications. Three waves of treatment were conducted with a total of 22 families using an iterative treatment approach, with adaptations made at each wave based on interventionist and participant feedback. **Results:** Twenty-two 8-12 year old overweight and obese children (~59% female; age = 10 (1.35); BMI% = 97.3 (1.9)) and their parents (~91% female; BMI=30.5 (6.3); 52% work in home) participated in treatment. Participants reported high acceptability and liking of the treatment program and its primary components (i.e. ~86% parents “liked a lot” or “loved” it; ~95% would recommend to other families; ~85% felt program helped child have more control over eating). Pre-post changes in child BMI-Z and parent BMI scores approached significance (child BMI-Z change = -.07, p < .10; parent BMI change = -.4, p < .09). **Conclusions:** Culturally-adapted FBT is a feasible and well accepted treatment for Latino children, with the potential to improve weight loss outcomes.

### T-176-P

**A Pilot Study of the Efficacy and Program Cost-Effectiveness of Prevention Plus for Childhood Obesity**

**Shannon Looney, Hollie Raynor Knoxville, TN**

**Background:** In 2007 recommendations for the treatment of childhood obesity in the primary care setting, using a staged-approach, were published. Limited research has evaluated the efficacy of these recommendations. Thus, this pilot study tested the efficacy of components of Prevention Plus (stage 1), using a tiered approach, for the treatment of childhood overweight and obesity in a primary care setting. Cost-effectiveness was also evaluated. **Methods:** Twenty-two overweight/obese children (8.0 ± 1.8 years; 2.34 ± 0.48 z-BMI; 68.2% female, 72.7% White, 90.9% non-Hispanic) were randomized to one of three, 6-month conditions: 1) newsletter (N); 2) newsletter and growth monitoring (N+GM); 3) newsletter and growth monitoring plus family-based behavior counseling (N+GM+BC). Primary outcomes were z-BMI and program cost-effectiveness for different medical professionals that may deliver the intervention in the primary care setting. Outcomes were analyzed using linear mixed-factor analysis of variance (ANOVA) and one way ANOVAs using the intent-to-treat principle. **Results:** There was a significant (p<0.05) main effect of time for z-BMI (AN+GM+BC: -0.16 ± 0.22, AN+GM: -0.08 ± 0.15, AN: -0.06 ± 0.24). Cost-effectiveness was significantly (p<0.001) different between conditions. The N condition had the smallest decrease in z-BMI, but was least costly condition due to minimal personnel costs, so appeared to be most cost-effective. While the N+GM+BC condition had the greatest decrease in z-BMI and was the most expensive due to high personnel costs, it was more cost-effective than the N+GM condition. **Conclusions:** N+GM+BC promoted the greatest change in z-BMI, but personnel costs should be considered during implementation.

### T-177-P

**Feasibility Study of Group Parent Training for the Prevention of Obesity (GPT-O) in Low-Income African Americans at a Community Clinic**

**Camden Elliott, Marian Tanofsky-Kraff Bethesda, MD; Nancy Zucker Durham, NC**

**Background:** Obesity prevention is a priority among young, African-American (AA) children. We therefore conducted a pilot study of an 8-week group parent training for obesity prevention program (GPT-O) within a community setting serving primarily low-income, AA families. GPT-O targets parent self-efficacy via instruction in general parenting skills (behavior modification, establishing routines), stress management, and nutrition education. **Methods:** Twenty parents/guardians of primarily obese (BMIz ≥ 2.5), AA youth (4.1±1.5, 70% female) were assigned to an open-trial of GPT-O. Parents completed questionnaire assessment of parenting and child eating behavior at baseline and post-intervention, and feasibility/acceptability questionnaires at post-intervention. Children’s height and weight were collected at baseline, post-intervention, and 3-month follow-up. **Results:** Retention through post-intervention was 75%. Of these participants, average attendance was 5.1±2.1 of 8 sessions. Parents reported enjoying the program (100%), and found it to be helpful (87%) and feasible (79%). At post-intervention, parents reported less authoritarian (p=0.02) and permissive (p=0.03) parenting, improved feeding practices, and a need among youth’s eating-related problem behaviors (p=0.01). Parent report of youth’s daily caloric intake was measured using a food frequency questionnaire. **Conclusions:** GPT-O is a feasible and acceptable method for obesity prevention education for low-income African American families.
intake decreased from baseline to post-intervention (p=.04), with less calories consumed from saturated fat (p=.04) and added sugars (p=.06). Child BMIz was unchanged from baseline to post-intervention (p=.70), but decreased by 3-month follow-up (p=.02). Conclusions: GPT-O is feasible and acceptable to AA families. Preliminary results suggest that GPT-O may improve parent and child behavior and prevent excess pediatric weight gain. An adequately powered and controlled trial is warranted to evaluate the efficacy and potential change mechanisms of GPT-O.

T-178-P
Compulsive Eating/Food Addiction Intervention for Obesity, Implemented as a Smartphone App: A Pilot Study
Robert Pretlow, Seattle, WA

Background: It was hypothesized that obesity is due to a confluence of: 1) uncontrollable eating of highly pleasurable foods, mostly as mindless self-medication for emotional comfort eating), characterized by cravings for specific foods and dependence (addiction) involving food sensations; and 2) stress-induced compulsive eating, a form of displacement behavior (akin to nail biting), involving the mechanics of eating, characterized by urges to eat nonspecific foods, and manifested by snacking/grazing and consumption of excessive food amounts. Methods: An intervention was developed to address the hypothesis and implemented as a smartphone app. A six month pilot study was conducted with 48 obese youth (mean BMI: 39.2), ages 10-21, 19 males, 25 females, in two phases: Phase 1, problem food withdrawal/abstinence aimed at food addictions; and Phase 2, displacement behavior intervention with urge/trigger control, alternate behaviors, and stress management, aimed at snacking/grazing elimination and food amounts reduction. Results: Phase 1 was associated with 2.5% initial body weight loss. Phase 2 was associated with weight regain, with net 1.5% initial body weight loss for the study. Mean snacking level of subjects at the start of the study was 3.6 (scale 1-5, 5 greatest) vs. 2.3 at the end (n=31). Unexpectedly, excessive mealtime food amounts constituted the main obstacle to weight loss. Furthermore, life traumas resulted in re-consumption of problem foods. Conclusions: Problem food withdrawal/abstinence resonated with the youth in this study and was effective for modest weight loss. Displacement behavior intervention was successful for curbing snacking/grazing, however, further research is needed for reducing large food amounts in this population. Treating emotional distress (basis of compulsive eating) is necessary for sustainability.

T-179-P
Food Log 2.0: Benefits of using "Photologs" to Increase Compliance with USDA MyPlate Recommendations among Adolescents
Sheethal Reddy, Cristiana Milone Atlanta, GA

Background: Food monitoring is associated with increased awareness of food choices and calorie intake. Among successful “losers,” food monitoring is associated with greater and more sustained weight loss (Wing & Hill, 2001). Common barriers to monitoring include time, shame/guilt associated with unhealthy food choices, and difficulty estimating portion sizes (Reyes et al., 2012). Also, there is a concern that food logs may create hypervigilance around caloric intake and instill a “diet mentality” for some children (Allen, Byrne, La Puma, McLean, & Davis, 2008). Most pediatric weight management programs emphasize a balanced plate approach based on current USDA recommendations (MyPlate). Given that MyPlate emphasizes a simpler visual, the use of a visual food log may be useful and appealing to adolescents. Methods: We implemented the “photo log” with a 17-year old male patient at Health4Life, an interdisciplinary childhood obesity program. Patient was seen 5 times over the course of 9 months. Results: After 4 months, BMI had increased from 51 to 54. Patient was then asked to send pictures of his meals on a weekly basis and received feedback from the nutritionist. Early photos revealed an irregular eating pattern, no fruits and vegetables, large carbohydrate consumption, and multiple servings at dinner. Photos gradually became more consistent with the plate method. Patient reported that the “photolog” was relatively easy to maintain and was easy to follow. Conclusions: Benefits include the ease of taking photos and more accurate portion size information. Future research will determine individual predictors of use and its direct effects on weight stabilization/loss.
Results: Despite the absence of a control group, interaction revealed a differential treatment effect on BMI z-scores between p<0.001) and physical activity (p<0.05) all improved. In girls, 42% had reduced waist circumference z-scores fell by 0.17 and 0.40 units respectively (both 1.8 to 2.8). In boys, 65% had reduced BMI z-scores, while mean BMI and sedentary activity levels, eating habits, self-esteem, parental perception of overweight children (8-11 yrs, 87% Black, 61% female, 73% obese). Intent-to-treat mixed models tested effects on cognition (Cognitive Assessment System), % body fat (DXA), and VO2 peak, measured at baseline and posttest. Group by time interactions and moderation by sex and COMT genotype were tested. Results: The exercise group showed reduced body fat and improved VO2 compared to the control group (adjusted mean difference in change -1.0%, 1.4 ml/kg/min, respectively, both p<0.04). There was no group by time effect on cognition. However, there was an interaction such that only the Met-Met COMT genotype showed a significant benefit of exercise on cognition (p<0.01). Boys, but not girls, showed an exercise benefit on cognition. Conclusions: 8 mo aerobic training in overweight, mostly Black children resulted in improved fitness and reduced fat. Cognitive benefits were limited to those with the Met-Met COMT genotype, and boys. The Met allele is far more common in Whites than Blacks, and associated with sexual dimorphism. Thus, exercise may provide more cognitive benefits for White males than other populations. Prior studies with non-intervention control groups may have confounded program elements like adult attention with physical exercise.

T-183-P
Two Year Outcomes Following Community-Based Management of Childhood Obesity: The MEND Program
Duncan Radley, Catherine Gammon Bromley, United Kingdom; Paul Chadwick London, United Kingdom; Maria Kolotourou, Lindsey Smith Bromley, United Kingdom; Tim J. Cole, Paul M. Sachet London, United Kingdom
Background: MEND (Mind, Exercise, Nutrition… Do it!) is an international programme that has shown promise in the UK. It is delivered in community settings with education and support provided to families. In the study, the impact of the programme on body composition, fitness, eating habits, psychological status and screen time was assessed with three outcome measurements: baseline, 6 months and 12 months.

Methods: Fifty-three MEND programs were conducted in community settings in London during 2009, and half were randomly selected for inclusion in the study. Of the 423 participants (with baseline BMI data) invited to participate, 286 families (68%) still had valid data. Eighty five (77%) adolescents, median age 13.1 [10 to 17 years], completed the 12 month intervention. Overall, the intervention had a significant impact on BMI and muscle mass (p<0.001) and physical activity (p<0.05) all improved. In girls, 42% had reduced BMI z-scores and eating habits and body esteem scores improved (both p<0.05). Other outcomes did not change significantly. Group by time interaction revealed a differential treatment effect on BMI z-scores between genders (p<0.001). Conclusions: Despite the absence of a control group, improvements in a number of health-related outcomes more than two years after program completion are encouraging and warrant further investigation, particularly in regard to the observed differences by gender.
T-186-P
Improvement in BMI Z-Score among Obese Youth Attending a 6-Day Overnight Summer Camp Did Not Predict Post-Camp Success in a Pediatric Weight Management Program
Shelley Kirk, Jessica G. Woo, Barbara Latran, Marysusan Sewell, Michelle Frank, Christopher Kist, Robert M. Siegel Cincinnati, OH

Background: A summer camp for obese children can provide a healthy lifestyle immersion experience. Our aim was to determine the impact of an overnight camp to improve weight (WT) status of obese children in a pediatric WT management program and whether improved WT status after camp was predictive of WT status change up to 6-months post-camp. Methods: A 6-day camp program was developed for obese children (ages 9-13) in a pediatric WT management program. The camp menu followed a reduced glycemic load diet. Age-appropriate portions were selected by campers using measuring cups at meals. Camp offered daily non-competitive physical activities. Height (HT) and WT were measured the first morning of camp, with WTIs repeated at the end of camp. Follow-up HTIs and WTIs were obtained at clinic visits up to 6-months post-camp. Results: Fifty-three (82%) of 65 children attending camp enrolled in the study. Subjects were 27 (52%) African-American, 25 (48%) Caucasian, and 19 (36%) male with median age = 11.4 years, BMI = 30.5 kg/m2, and BMI z-score = 2.35. Subjects were grouped by their success as measured by median improvement in BMI z-score (low: ≤ -0.01; medium: -0.01; high: >-0.05) at end of camp. Thirty-one (58%) of subjects completed follow-up measurements with a significantly greater proportion (p=0.025) of the high success group [low: 6 (35%); medium: 11 (65%); high: 14 (82%)]. Comparing end of camp and final follow-up measurements, only the high success group had a significant increase in BMI z-score at follow-up (median change = +0.04; p<0.05). Comparing change in median BMI z-score from baseline to final follow-up, there was no significant difference in any group and no association between time of final follow-up and WT status change. Conclusions: Improvement in WT status among obese children attending camp was not predictive of longer-term WT status outcomes.

T-187-P
Understanding Health Perceptions and Food Behaviors among Low-Income, Urban African American Youth to Reduce Risk for Obesity
Yeeli Mui, Bernice Chu, Neha Trivedi, Joel Gittelsohn Baltimore, MD

Background: Urban low-income African American youth are less likely to meet dietary recommendations and are at higher risk for obesity. Youth in this setting are heavily exposed to energy-dense, high fat foods in an obesogenic environment, but little work has been done to identify potential exposures to healthy foods in this setting. We sought to identify the most influential sources of information about healthy food behaviors, particularly urban farming and gardening, as well as the preparation of fresh foods. Methods: In-depth interviews (n=24) with African American children aged 10-14 years from underserved neighborhoods of Baltimore City. Questions to identify salient sources of information about healthy foods, and influence of each source on youth’s perception of fresh foods and healthy food behaviors. Results: Family members and school programs were most influential. The role of mothers in youths’ exposure to healthy foods and healthy food behaviors was mentioned most frequently, followed by grandmothers and school programs. Youth highly valued their level of independence from peer influences, resulting in peers having little reported influence on youth food decision-making, especially if peers’ choices were perceived to be unfavorable. Conclusions: Building on the female caregiver-youth relationship may be a more sustainable way of promoting healthy food behaviors among youth in low-income urban settings. These data will contribute to a systems science model to intervene at multiple levels for improving the Baltimore City food environment and reduce childhood obesity.

T-188-P
The Role of Children’s Perceived Parental Support in an Obesity Intervention Targeting Low-Income Rural Schools and Communities
Stephanie Anzman-Frasca, Raymond B. Hyatt Boston, MA; Vivica I. Kraak Barnwood, Australia; Christina D. Economos Boston, MA

Background: Parent support is an important influence on the success of school-based obesity interventions. We examined children’s perceptions of parental support in the CHANGE Study, a two-year obesity prevention intervention implemented in eight, rural elementary schools and low-income communities in four states (CA, KY, MS, SC). Methods: Ethnically and racially diverse school-aged children enrolled in the CHANGE Study were assessed at three time points between 2008 and 2009. Children who provided data on perceived parental support (PPS) at baseline and at least one other time point were included (n=463). At each time point, children completed three survey items assessing PPS for physical activity and fruit and vegetable consumption. Heights and weights were measured, and children’s BMI z-scores were calculated using CDC growth charts. The PPS items were significantly correlated and were aggregated into a composite measure (range: 1-4). Mixed models tested whether baseline PPS moderated the intervention’s impact on PPS change, and whether final PPS was associated with concurrent weight status among children with BMI z-scores available at the third time point (n=322). Models were adjusted for child age, sex, and race/ethnicity and parent education. Results: There was an interaction between intervention group and baseline PPS predicting change in PPS (F(1, 441)=4.28, p<0.05): for those low on baseline PPS, the intervention increased PPS, while for those high on baseline PPS, the intervention had no effect. There was an inverse association between PPS and children’s BMI z-scores at the third time point, such that higher PPS was associated with a lower weight status (p<0.05). Conclusions: Children’s perceptions of parental support may play a role in the efficacy of childhood obesity prevention efforts in low-income rural communities.
T-190-P  
**Sustained Reduction in the Levels of Gamma Prime Fibrinogen and Other Coagulation and Inflammation Factors in Obese Children: A 1-Year Randomized Controlled Family-Based Lifestyle Intervention**

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**Background:** Coagulation & inflammation are two critical pathophysiological processes involved in the development of cardiovascular disease (CVD). Obesity-related alterations in these processes are evident at an early age in children. Gamma (γ) fibrinogen, an isoform of fibrinogen forms more fibrinolytic-resistant clots and has been implicated as an independent risk factor for CVD, myocardial infarction and stroke in adults. Its elevated levels have been recently reported in obese adolescents. The current study aimed to determine the effect of a Family Based Intervention (FBI)-program on γ fibrinogen and other coagulation and inflammation factors in obese children.

**Methods:** A total of 130 children (age-adjusted BMI≥85th percentile) were recruited for a 1-year randomized controlled outpatient FBI-program that included enhanced physical activity, dietary counseling and behavior modifications. Anthropometry, OGTT, γ fibrinogen, total (T)-fibrinogen, CRP, IL-6 and PAI-1were measured at baseline, 6-months & 12-months. **Results:** 115 participants (age: 9.9±1 yrs; BMI≥85th; 97.7±2.3,63% female) completed the studies (baseline, 6 & 12-months). The concentration of γ fibrinogen, T-fibrinogen, IL-6, IL-8 (p=0.05 for all) and CRP (p=0.07) decreased in the intervention group. zBMI scores also showed a decrease (p=0.05) at 6-months and persisted after 12-months. A steady increase in the levels of these parameters was noted in the control group.

**Conclusions:** Because γ fibrinogen increases the propensity for thrombosis and stroke at an early age in the clinical course of obesity, the sustained reduction in its elevated levels by the FBI-program is important. The coordinated decrease in γ fibrinogen, other coagulation and inflammation factors along with zBMI scores in obese children over one year suggest the sustainability of cardiovascular benefits by this intervention in obese children.

T-191-P  
**Change in Resting Energy Expenditure and Step Test Recovery Heart Rate among Children and Adolescents Who Are Overweight or Obese Following a Weight Loss Intervention**

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**Background:** While resting energy expenditure (REE) and step test recovery heart rate (RHR) have been studied independently as metabolic and fitness tests in children and adolescents who are overweight or obese, the relationship between REE and RHR and changes following a weight loss intervention have not been examined. Our objective was to evaluate the relationship between REE and RHR and post-intervention changes among participants in Healthy Kids, Healthy Weight, a 12-week, multi-disciplinary weight loss program (SG) and 10 were assigned as a control group (CG). The soccer program involved sessions 60–90 min, 4 times/week; average intensity >80%HRmax.

**Methods:** Resting metabolic rate was predicted by degree of obesity, age and sex but not by fitness level. In a subsample, the majority experienced post-intervention improvement in a subsample, the majority experienced post-intervention improvement in attraction to PA, perceived physical competence, self-esteem, body image, and number and reason for subject withdrawal. **Results:** REE increased in 15/24 (63%), RHR declined in 16/24 (67%). Changes in REE and RHR were not significantly related, but change in RHR was significantly correlated with baseline RHR (r=0.43, p=0.04). **Conclusions:** Among children and adolescents who are overweight or obese, being evaluated for a weight loss program, baseline resting metabolic rate was predicted by degree of obesity, age and sex but not by fitness level. In a subsample, the majority experienced post-intervention improvements in their metabolism and fitness levels. Greater increases in metabolic rate related to baseline lower fitness levels.

T-192-P  
**Interventions with Children and Parents to Improve Physical Activity and Body Mass Index: A Meta-Analysis**

Portia Johnson, Jane C. Dellert South Orange, NJ

**Background:** The purpose of this meta-analysis was to examine the overall effect on children’s physical activity and body mass index of interventions with parents and children. **Methods:** Data Source: Computerized searches for intervention studies published between 1990 and 2011 used multiple ProQuest databases, including unpublished dissertations and theses to minimize publication bias. Study Inclusion and Exclusion Criteria. English-language, intervention-testing studies of children, parents, or families with outcomes of physical activity or body mass index were retrieved from peer-reviewed journals, dissertations and theses. Eliminated studies had no control or comparison group; no continuous outcome variable; physical activity/exercise and/or body mass index not outcomes; or incomplete statistics necessary for meta-analysis (means, standard deviations or confidence intervals). Data Extraction. Twenty-one studies met inclusion criteria. Quality criteria were control group, objective outcome variable measure, clarity of variable definitions, and number and reason for subject withdrawal. **Results:** MWES for interventions with parents and children on physical activity (Z = 2.92; CI =0.48; p = 0.002) and on body mass index (BMI) for interventions with children alone (Z =-2.10; CI = -0.16, -0.01; p = 0.02) were significant. **Conclusions:** A significant effect on physical activity but not on body mass index was found when interventions included both parents and their children.

T-193-P  
**Effects on Body Composition, Physical Fitness and Psychological Well-Being After a 6-Month Soccer Intervention Program in Overweight Children**

Andre Seabra, Ana Seabra, Susana Vale, António Rebelo, Jorge Mota, João Brito, Carla Rêgo Porto, Portugal

**Background:** This study examined the effects of an intervention program of 6-months of soccer instruction and practice on the body composition (BC), physical fitness (PF) and psychological well-being (PWB) of overweight children. **Methods:** Twenty overweight children (8-12 years old) participated in the prospective observational cohort study: 10 were assigned to a soccer program (SG) and 10 were assigned as a control group (CG). The soccer program involved sessions 60–90 min, 4 times/week; average intensity >80%HRmax.

**Results:** From baseline to after 6 months, SG demonstrated greater increases in attraction to PA, perceived physical competence, self-esteem, body image, lumbar spine BMD and BMI compared to CG (p<0.05). For the other BC components and PF tests, although SG have shown a higher increase in mean values across intervention, no significant differences were found between both groups (p<0.05). **Conclusions:** These findings provide preliminary evidence that a 6-month soccer intervention in overweight boys was effective in improving lumbar spine BMD, muscle strength and PWB, but did not result in significant changes in others BC and PF variables.
(>85th percentile for body mass index [BMI]) children aged 4 to 9 yrs (61.5% female, 84.6% white, 16% Hispanic), with complete dietary, anthropometric, and demographic data at baseline. ED values were calculated from 3-day food records. Participants were classified as consuming a low-a (<1.05 kcal/g) [LOW], medium-a (1.06-1.27 kcal/g) [MED], or high-a (>1.28 kcal/g) [HIGH] diet using tertile cut-offs. Analyses of covariance, with sex controlled due to group differences, examined self-reported energy, macronutrient, and daily food group servings consumed. Results: In comparison to HIGH (ED=1.49 +/-0.20 kcal/g), LOW (ED=0.91 +/-0.12 kcal/g) and MED (ED=1.18 +/-0.7 kcal/g) consumption was significantly less energy (p<0.05) than MED and HIGH. LOW consumed more energy from carbohydrate (p<0.01) than HIGH. No differences were found in energy consumed from protein. In comparison to HIGH, LOW consumed fewer daily servings of whole and reduced-fat dairy (p<0.01), grains (p<0.01), added fat and sugars (p<0.05), and nuts and seeds (p<0.05), and more daily servings of fruits and vegetables (F&V) (p<0.05).

Conclusions: Consumption of a lower-a diet is related to consumption of less energy, fat, higher-fat foods groups, and greater intake of F&V in overweight young children. This speaks to the potential utility of targeting ED within pediatric obesity treatment.

T-195-P
A Parent-Targeted Mobile Phone Intervention to Increase Physical Activity in Sedentary Children
Arwen M. Marker, Ryan J. Machtmes, William D. Johnson, Catrine Tudor-Locke, Stephanie Broyles, Timothy Church, Robert L. Newton Baton Rouge, LA

Background: To investigate the efficacy of a 12-week mobile phone-based intervention on physical activity levels in children. Methods: Sedentary (>9,500 steps/day for girls, >12,500 for boys) children aged 6-10 years were randomly assigned to an intensive intervention or minimal intervention. All intervention aspects were delivered via mobile phone. Parents in both groups were given a goal to increase their child’s activity by 6000 steps/day above baseline and monitored steps daily. Parents in the intensive intervention group received behavioral strategies and text messages designed to promote their child’s physical activity, whereas the minimal intervention parents received no behavioral strategies. Anthropometrics, body composition, mood, sedentary behavior, and enjoyment of physical activity were measured.

Results: 20 children (Mean age = 8 yrs; 50% Female; 45% White; BMI z-score = 1.36; BMI percentile = 83) completed the study. At baseline, girls achieved 7377 steps/day and boys 9595 steps/day. Children in the intensive and minimal intervention groups significantly increased their activity by 2984 and 2158 steps/day, respectively (p < .002), but between group differences were not significant (p >.05). Regardless of study group, children who significantly increased their physical activity reported greater increases in physical activity enjoyment (p <.003). Changes in steps/day were unrelated to changes in body composition, mood, or sedentary behaviors. Conclusions: Children of parents who self-monitored steps daily and were given a specific steps/day goal increased their activity, approximating a 20-30 minute increase in moderate daily activity. This suggests that family-based mobile phone interventions have promise, yet more intensive interventions are needed to help sedentary children increase their physical activity to the recommended 60 minutes per day.

T-196-P
Predictors of Success in a Community-Based, Multidisciplinary, Weight Management Program for Inner-City, Minority Adolescents
Unah Khan Bronx, NY; Lauren Connell University Park, PA; Jessica Rieder Bronx, NY

Background: There is limited understanding of factors predicting successful weight outcomes, especially outside of research settings. We sought to identify baseline predictors that increased the likelihood of success in obese, minority adolescents attending a community-based, weight management program. Success outcomes included: weight loss (% BMI change), sedentary activity (SA) < 3 hrs/day, fruit or vegetable intake >4 servings/day, physical activity (PA) >9hrs/2 weeks at 9 months. Methods: From 2007-2012, of 538 participants, 179 completed the program. Mean age = 14.85 ± 2.04; 57% females; 50% Hispanics; 45% black. Regression models for each success outcome were adjusted for age, sex, ethnicity, motivation, compulsive eating, self-esteem, baseline BMI and baseline predictor behaviors (SA, fruit and vegetable intake, and PA). Results: Older age (β: -0.007; p: 0.007) and more baseline BMI intake (β: 0.01; p:0.04) were associated with greater weight loss at 9-months. Higher self-esteem is associated with increased odds of >4 veget.

OBESITY 2013 ABSTRACT BOOK
POSTER ABSTRACTS – WEDNESDAY, NOVEMBER 13 TO FRIDAY, NOVEMBER 15, 2013

T-197-P
Preventing the Pounds: Formative Work to Develop a Weight Gain Prevention eLearning Platform for Older Adolescents
Melissa A. Napolitano, Laurie Possey, Jean L. Gutierrez, Sarah Lynch, Kelley Vargo, Katrina Hofnagel Washington, DC

Background: Seventy percent of adolescents matriculate to college, with weight gains by graduation averaging 1.7 to 4.2 kg for females and males, respectively. While colleges provide eLearning offerings for some high-risk health behaviors (e.g., alcohol), most lack scalable programming for weight gain prevention. Methods: We describe baseline data and preliminary results from “Raise High for a Healthy U” designed to: 1) quantify physical activity (PA), eating behaviors, and technology use; 2) assess preferences and to develop a weight gain prevention eLearning platform for matriculating freshmen. Undergraduates (n=82; 74.3% female; mean age=18.66 ± 0.8; 87.7% White; mean BMI=23.02 ± 3.5; 25% had a BMI ≥ 25) completed an online survey to assess targets described above. Results: Health behaviors: Minutes of moderate intensity PA=103.15±95.5 S, Hours sitting per day=8.13±5.0, Days eating breakfast=4.07±1.46. 46.7% of participants bought quick-order foods > 2x/week (p<NS, for weight status differences). Technology: The top 5 technologies used for learning were: Laptops (96%), Facebook (82.2%), mobile “Apps” (50%), Twitter (35%), Blogs (21%). The top 5 preferences for healthy eating/PA networking were: “Apps” (34%), Facebook (13%); Podcast (11%); Blog (11%); Twitter (4%). Similarly, “App” was most commonly endorsed (56%) for receiving tailored feedback followed by personalized letter (13%), and social media (10%). Qualitative themes for intervention content: eating on a budget, campus-specific information, focus on stress/mood, and confidentiality. Most students (86%) preferred weekly feedback. Conclusions: This research is an important first step in improving the eating/PA habits and health of older adolescents. Implications of this formative work, as well as sample prototypes and modules of the eLearning platform will be discussed.

T-198-P
Anticipation of Exercise Discomfort, Health-Related Quality of Life and Fitness in Obese Youth
Connie L. Tompkins, Amy Nickerson, David Brock Burlington, VT

Background: While several studies have shown that obesity impairs health-related quality of life (HRQOL), physical inactivity may also affect HRQOL regardless of weight status. For obese individuals, the anticipation of discomfort may also complicate the decision whether or not to engage in exercise. Subsequently, this inactivity may lead to lower cardiorespiratory fitness (CRF). Therefore, the purpose of this study was to explore the relationship among anticipation of exercise discomfort, HRQOL, and CRF in obese youth. Methods: Prior to beginning the REWARD Teens multi-disciplinary, weight management program, 25 obese [≥95th BMI percentile] youth (12-18 years; 10 males, 15 females) participated in a standardized, treadmill walking test to assess CRF (VO2 max mL/kg/min). Prior to the test, participants were asked to rate how much discomfort (on a scale of 0-10) they expected to experience. The Pediatric Quality of Life Inventory (PedsQL) Measurement Model for teens was also administered to obtain HRQOL. Partial correlations were performed with significance set at p<0.05. Results: Adjusted for BMI, significant, inverse relationships were observed between anticipation of exercise discomfort and CRF (r=-0.538) and anticipation and HRQOL (r=0.633). Significant, positive correlations were observed between CRF and HRQOL (r=0.535) adjusted for BMI. Adjustment for sex, however, large significant correlations were observed between BMI and anticipation of exercise difficulty.
Early obesity prevention efforts aimed at decreasing TVT may benefit from helping families reduce RT. USDA AFRI # 2011-68001-30207

T-201-P

Effects of a Multidisciplinary Lifestyle Intervention on Aerobic Fitness and Motor Skills in Obese Adolescents
Patricia Blackburn, Mario Leon, Lisa Houdé, Véronique Julien, Julie St-Pierre, Dominique Desrosiers, Johanne Harvey Chicoutimi, Canada

Background: Obesity and low aerobic fitness in adolescents are associated with cardiometabolic risk factors. Low motor competence also increased the likelihood to be physically inactive. In this regard, studies are needed to optimize physical fitness in this population. The objective of the study was to examine the effects of a 16-week exercise training program combined with a multidisciplinary intervention on aerobic fitness and motor skills performance in obese adolescents.

Methods: Thirty-three obese adolescents from 11 to 16 years of age were selected to participate. Each subject was followed by a multidisciplinary team and trained three sessions per week for 16 weeks.

The exercise program focused on endurance type activities and all training sessions were supervised and performed in groups. Maximal oxygen uptake, walking capacity and motor skills were measured at baseline, at mid-time and at the end of the intervention as well as 4 months and 8 months follow-up.

Results: Body mass index (33.6 to 32.7 kg/m², p=0.0002) and waist circumference (102.4 to 100.5 cm, p=0.05) were significantly reduced after the 16-week intervention program. However, we found that anthropometric variables were returned to baseline levels only 4 months after the 16-week intervention program. The most significant improvements observed were in maximal oxygen uptake and in walking capacity were observed 8 weeks after the beginning of the intervention (p=0.002). These variables were also returned to baseline levels 4 months after the intervention. Significant improvements were also observed in some motor skill tests (p<0.04). However, we found that few of these motor skills remained improved 4 and 8 months post-training (p=0.0009).

Conclusions: These results indicate that a multidisciplinary intervention, which includes exercise training, may have a persistent effect on motor skills.

T-202-P

Maternal Feeding Styles and Child’s Dietary Intake among Recent Immigrants
Alison Tovar Kingston, RI; Erin Hennessy Washington DC, DC; Aviva Must Boston, MA; Sheryl O. Hughes Houston, TX; Silvéna F. Choumenkivitch, David M. Gute, Rebecca J. Boulous, Emily K. Vikre, Christina D. Economos Boston, MA

Background: Immigrants are at increased risk for becoming obese with more time in the US. Parental feeding styles may be one potential modifiable risk behavior given their influence on children’s food preferences, consumption, portion sizes, and energy intake. However, the relationship of feeding styles and child’s dietary among immigrants is unexplored.

Methods: Anthropometrics, socio-demographics, child dietary intake, years in the US and responses to the Caregiver Feeding Styles Questionnaire (CFSQ) were obtained from 313 mothers enrolled in LiveWell, a community-based, participatory, randomized controlled lifestyle intervention to prevent weight gain in immigrant (<10 years residence) mother-child dyads in Greater Boston. Associations were explored with multivariable linear regression.

Results: The influence of feeding style on child diet was modified by the immigrant’s age of immigration (<10 years residence) and by the child’s age. In this sample, maternal feeding styles had a significant effect on child’s dietary intake. Maternal feeding styles were found to be associated with child’s dietary intake, especially in the first 5 years of residence. Maternal feeding styles were also found to be associated with child’s dietary intake, especially in the first 5 years of residence. Maternal feeding styles were also found to be associated with child’s dietary intake, especially in the first 5 years of residence.

Conclusions: This study is a first step in understanding the role of feeding styles in the dietary intake of immigrant children. Further research is needed to understand the influence of feeding styles on the dietary intake of immigrant children.

T-203-P

Family Partners for Health Study: Final Results of a Randomized Controlled Community-Based Trial for Weight Management of Obese Children and Their Parents
Diane C. Berry, Todd A. Schwartz, Robert G. McMurray, Madeline Neal, Emily Gail Hall, Dean Amatuli, Nattarae Annyong Chapel Hill, NC

Background: Overweight and obesity continue to increase at an alarming rate in African American, Hispanic, and non-Hispanic white children and parents.

Methods: The Family Partners for Health Study was a community-based randomized controlled trial that tested a nutrition and exercise education, coping skills training and exercise intervention for obese (BMI > 85th percentile) and overweight (BMI > 80th percentile) children in the experimental group compared to the wait-listed control group that did not have a significant decrease in BMI percentile (p = 0.470) or waist circumference (p = 0.060), however did have a significant decrease in triceps skinfolds (p < 0.001) and subscapular skinfolds (p < 0.001) and significantly improved their dietary knowledge (p = 0.018) and were more likely to drink less than 1 glass of soda per day (p = 0.052). Parents in the experimental group compared to the wait-listed control group significantly decreased their body mass index (p = 0.001), weight loss in kilograms (p = 0.002), percent weight loss (<0.001), waist circumference (p = 0.005), triceps skinfolds (p < 0.001) and subscapular skinfolds (p < 0.001) and increased their nutrition (p = 0.003), exercise (p < 0.001) and health responsibility (p = 0.055) knowledge and more often chose water or unsweetened drinks when thirsty (p = 0.029) and ate unsweetened breakfast cereal (p = 0.009).

Conclusions: The results suggest that including both parents and children in the same intervention improved the weight and adiposity and health behaviors in both children and parents and self-efficacy in the parents. Once children and parents are obese, nutrition and exercise habits are harder to change and they may require longer support. Trial Registration: NCT01378806

T-204-P

Relationships between Infant Tummy Time, Restrained Time and TV TIme in Low-Income Hispanic Families at Highest Risk of Early Child Obesity
Rachel S. Gross Bronx, NY; Roberta Scheinmann, Michelle Gross, Kenny Diaz, Candice Taylor-Lucas, Alan L. Mendelsohn, Suzy Tomopoulos, Mary Jo Messe Santa New York, NY

Background: Early obesity prevention policies recommend increased active and decreased sedentary time in infancy, by promoting tummy time (TT) and limiting time TVT time (TVT) and time in devices that restrain movement (RT).

The prevalence of these practices and relationships between them are not well described. We aimed to characterize the relationship between TT and sedentary time (RT and TVT) in month-old infants at high risk for early childhood obesity.

Methods: Cross-sectional analysis of low-income Hispanic mothers with 3 month old infants in a longitudinal study of child obesity prevention efforts. More research is needed to better understand the coping strategies of these families. Obese, nutrition and exercise habits are harder to change and they may require longer support. Trial Registration: NCT01378806

Conclusions: Notably, when we controlled for CRF significant associations between the variables were no longer observed. Further research exploring CRF as a potential mechanism by which BMI influences HRQOL and anticipation of exercise discomfort is warranted.

T-199-P

Effects of a Multidisciplinary Intervention on Aerobic Fitness and Motor Skills in Obese Adolescents
Patricia Blackburn, Mario Leon, Lisa Houdé, Véronique Julien, Julie St-Pierre, Dominique Desrosiers, Johanne Harvey Chicoutimi, Canada

Background: Obesity and low aerobic fitness in adolescents are associated with cardiometabolic risk factors. Low motor competence also increased the likelihood to be physically inactive. In this regard, studies are needed to optimize physical fitness in this population. The objective of the study was to examine the effects of a 16-week exercise training program combined with a multidisciplinary intervention on aerobic fitness and motor skills performance in obese adolescents.

Methods: Thirty-three obese adolescents from 11 to 16 years of age were selected to participate. Each subject was followed by a multidisciplinary team and trained three sessions per week for 16 weeks.

The exercise program focused on endurance type activities and all training sessions were supervised and performed in groups. Maximal oxygen uptake, walking capacity and motor skills were measured at baseline, at mid-time and at the end of the intervention as well as 4 months and 8 months follow-up.

Results: Body mass index (33.6 to 32.7 kg/m², p=0.0002) and waist circumference (102.4 to 100.5 cm, p=0.05) were significantly reduced after the 16-week intervention program. However, we found that anthropometric variables were returned to baseline levels only 4 months after the 16-week intervention program. The most significant improvements observed were in maximal oxygen uptake and in walking capacity were observed 8 weeks after the beginning of the intervention (p<0.002). These variables were also returned to baseline levels 4 months after the intervention. Significant improvements were also observed in some motor skill tests (p<0.04). However, we found that few of these motor skills remained improved 4 and 8 months post-training (p<0.0009).

Conclusions: These results indicate that a multidisciplinary intervention, which includes exercise training, may have a persistent effect on motor skills.
T-203-P
Effects of a School-Based Education Intervention on BMI and Physical Activity
Lauren M. Panter Valparaiso, IN

Background: The CDC (2011b) reported that there are 12.5 million obese children and adolescents living in the United States (U.S.). The financial burden of childhood obesity in the U.S. is estimated to be 14 billion dollars (Children’s Defense Fund, 2012). Methods: The primary outcome measure of this evidence-based practice (EBP) project was BMI. A secondary outcome measure focused on the amount of time children spent engaging in physical exercise on a daily basis. For eight weeks, fourth and fifth grade students at a rural elementary school received an additional 30 minutes of classroom education about the importance of physical activity and suggestions for increasing daily physical activity. Student participants were weighed and their height was measured before and after the intervention so that BMI measurements could be calculated and compared. Additionally, students completed pre- and post-tests using the Self Administered Physical Activity Checklist (SAPAC) to assess individual levels of daily physical activity. Data was calculated at the conclusion of the eight week intervention and paired t-tests were calculated to determine whether or not BMI was affected by the inclusion of additional physical activity education in the classroom. Results: No statistically significant differences in BMI were found. However, 27 students lost weight with 20 of these students losing more than one pound and nine losing four pounds or more. Conclusions: Future projects similar to this one could benefit from a longer intervention period and increased teacher involvement in regular in-classroom exercise. Successful projects have the potential to contribute to decreased rates of childhood obesity.

T-204-P
Eating Out is Related to Increased Sugar Intake among Rural Appalachian Adolescents: Results of the Team Up for Healthy Living Project
Taylor L. McKeohan Johnson City, TN; George E. Relyea Memphis, TN; Deborah L. Lawson Johnson City, TN

Background: Adolescent obesity has reached epidemic proportions with 13% reported being obese in 2011. Dietary habits, particularly those related to eating meals and snacks away from home, have been shown to impact dietary quality. Methods: An assessment of 1,503 Northeast Tennessee adolescents was conducted as part of the Team Up for Healthy Living research project. Frequencies of eating out for breakfast, lunch, supper, and snacks were assessed, as was the frequency of consumption of 84 food and beverage classifications using the Speck Eating Habits Questionnaire. Reported intakes were then converted to a Health Eating Index (2010). Frequency of eating out and the energy from added sugars in the diet were calculated. Results: Adolescents who ate out daily or 3-6 times per week had significantly higher energy intake from added sugars compared to adolescents who reported not eating out in the last week or never eating out (ps <.001). The largest reported energy from added sugars was from eating out at breakfast and for snacks. Gender differences were evident. Males had significantly higher added sugar intakes (ps <.011) and were more likely to report eating out daily for breakfast, lunch, supper, and snacks (ps <.001). Females reported eating out less frequently (1-2 times a week) for lunch and supper (ps <.001). Conclusions: Adolescents who eat meals away from home are more likely to have a higher energy from added sugars. Interventions to encourage healthy body weight should include a focus on healthy eating out and reducing sugar intake.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

T-205-P
Overweight/Obesity, Serum Vitamin D Inadequacy and Low HDL-C in Urban Schoolchildren
Jennifer Sacheck, Maria Van Rompay, Misha Eliasizw, Christina D. Economos Boston, MA

Background: Approximately 30-50% of overweight and obese US children have inadequate serum vitamin D (25-hydroxyvitamin D [25(OH)D]<20 ng/mL). Being overweight or obese appears to promote vitamin D inadequacy, differential responses to supplementation, and cardiovascular disease (CVD) risk factors; however, little is known about these relationships in children. Methods: In wave one of The Daily D Health Study (DDHS), 310 racially/ethnically-diverse schoolchildren (9-14y; 38% Caucasian) were enrolled in a randomized vitamin D3 supplementation trial. Multivariable logistic regression was used to assess associations with weight status, vitamin D, and CVD risk factors. Results: At baseline, 60% had inadequate 25(OH)D, 46% were overweight or obese, and 60% exhibited a1 suboptimal blood lipid or glucose level. Overweight/obesity was not related to vitamin D inadequacy, but both weight and vitamin D status were associated with CVD risk factors, after controlling for age, sex, and race/ethnicity. Overweight/obese children had 3.7 greater (P<0.001) odds of having low HDL-C (≥45 mg/dL). Children with vitamin D inadequacy had 2.4 greater (P<0.007) odds of having low HDL-C, but this relationship was stronger for normal weight children (OR=3.9 vs. 1.8) and for Hispanics (OR=3.7 vs. 1.3). After 6 months of supplementation, overweight/obese children experienced smaller increases in 25(OH)D than normal weight children (7.1 vs. 10.6 ng/mL, P=0.002), with differences more evident among certain racial/ethnic groups. However, in this sample of the larger DDHS trial, 6-month changes in 25(OH)D were not associated with CVD risk factor changes. Conclusions: Preliminary trial results suggest relationships among overweight/obesity, serum 25(OH)D, and CVD risk factors in children, but longitudinal relationships and the role of race/ethnicity warrant a larger study population.

T-206-P
Treatment Adherence and Facilitator Characteristics in a Community Based Pediatric Weight Control Intervention
Elissa Jelalian Providence, RI; Gary D. Foster Philadelphia, PA; Amy F. Sato Kent, OH; Kristoffer Berlin Memphis, TN; Cynthia McDermott Providence, RI; Deborah Sundal Minnetonka, MN

Background: There is a pressing need to develop effective and broadly accessible interventions to address pediatric obesity. An important dimension in translating interventions to community settings is the fidelity with which treatment is delivered. Methods: We examined treatment fidelity and facilitator characteristics in a 24-week community based pediatric behavioral weight control (BWC) intervention for youth ages 6-17. The JOIN program involved collaboration between UnitedHealth Group and the YMCA of Greater Providence. Sessions were led by YMCA-based facilitators. Adherence to weekly content and facilitator characteristics were assessed via direct observation at two randomly selected points during the intervention: T1 (selected from sessions 1-4) & T2 (selected from sessions 6-20). Results: Participants were on average 11.3 years old (SD=2.8). Fifty-five percent were female and over two-thirds were White (68.4%). There was a significant reduction in percent overweight (M=3.5%) from baseline to 24 weeks. On average, facilitators adhered to 96.0% (SD=5.2%) of the session content at T1 and 92.6% (SD=6.8%) at T2. Relationships among facilitator adherence, facilitator characteristics, and rate of change in percent overweight were examined using random effects growth modeling. Higher facilitator content adherence at T1 and T2 were associated with greater reductions in percent overweight (p<.01) at 24 weeks. Higher ratings of facilitator characteristics at T2 were associated (0.06) with larger reductions in percent overweight after 24 weeks. Conclusions: Data suggest that paraprofessionals without prior expertise in pediatric weight control can be trained to successfully deliver an evidence-based BWC intervention. Facilitator adherence to the treatment protocol was more related to treatment outcome than were more general facilitator characteristics.

T-207-P
Longitudinal Associations between Change in Overweight Status, Fear of Negative Evaluation and Weight-Related Teasing among Obese Adolescents
Diana Rancourt, David H. Barker Providence, RI; Amy Sato Kent, OH; Chantelle N. Hart, Elissa Jelalian Providence, RI

Background: Obese adolescents experience weight-related stigma and victimization, which are associated with fear of negative evaluation (FNE). While FNE increases during adolescence, behavioral weight control interventions (BWC) can lead to decreases in obese adolescents’ FNE. Secondary data analysis was conducted to examine longitudinal cross-lagged associa-
tions between obese adolescents’ change in weight status, FNE, and weight-related teasing using data from a 24-month BWCI. Methods: One hundred eighteen obese adolescents (BMI: M = 31.41; Percent Overweight: M = 161.43; 76% Non-Hispanic White; 68% female) 13-16 years (M = 14.33) participated in a BWCI. Percent overweight. Fear of Negative Evaluation (subscale, Social Anxiety Scale – Adolescent), and frequency of weight-relocated teasing (item adapted from Project EAT) were collected at baseline, end of intervention (4 months), and 12 and 24 months post-intervention. Three multivariate latent difference score models were estimated to examine longitudinal cross-lagged associations between: 1) percent overweight and FNE; 2) percent overweight and teasing; and 3) FNE and teasing. Results: Models supported significant lagged associations among the constructs of interest through 24 months. Decreases in percent overweight were prospectively associated with decreases in both FNE (b = .16, p < .01) and weight-related teasing (b = -.01, p < .01). Neither change in FNE nor weight-related teasing was predictive of changes in percent overweight. Decreases in FNE were prospectively associated with decreases in weight-related teasing (b = .05, p < .01). Change in weight-related teasing was not predictive of changes in FNE. Conclusions: Moderate weight loss in the context of a BWCI intervention has positive long-term implications for obese adolescents’ peer relations.

T-208-P

Reliability of the EchoMRI-Infant System for Water and Fat Measurements in Newborns

Tatiana Toro-Ramos, Charles W. Paley, Susan Lin, Wenwen Yu, Xavier Pi-Sunyer, Dymnna Gallagher New York, NY

Background: The precision of the quantitative magnetic resonance (EchoMRI-Infants™) system has not been determined in newborn infants. Methods: Phantoms including canola oil and drinking water in increments of 10 g up to 1.9 kg were scanned twice within one day at body temperature (37°C). Instrument reproducibility was assessed from 3 scans with repositioning between scans (within 10 min period) in 12 healthy term newborns (12-69 hours post birth). Instrument precision was determined from the coefficient of variation (CV) of the difference between repeated scans for total water, lean, fat measures for newborns and the mean difference between weight and measurement for phantoms. Results: In phantoms, EchoMRI: 1) underestimated fat with a mean difference of -18 g (SD 33 g; range -130 g to 50 g). As oil mass increased, the larger the underestimation of EchoMRI measured fat; 2) overestimated free water (water not bound to tissues), with a mean difference of 23 g (SD 43 g; range -90 g to 130 g). Water phantom and measured free-water were highly correlated (r = 0.999, p < 0.001) 3) underestimated total water with a mean difference of -84 g (SD 81 g; range -380 g to 30 g). Water phantom and measured total water were highly correlated (0.997, p < 0.001). In newborns, mean weight (SD, range) was 3.13 kg (0.44, 2.64-4.19 kg), mean fat 0.54 kg (0.20, 0.07-0.88 kg), lean 2.32 (0.28, 2.0-2.9 g, total body water 2.42 (0.31, 2.12-3.10), and percent fat 16.65% (2.67, range 12.53-20.71%). EchoMRI showed excellent reproducibility with a CV of 0.09% for total body fat, 0.98% for lean mass, and 0.81% for total body water. Conclusions: The EchoMRI infant system shows good reliability for the measurement of fat, free water, and total water in oil and water phantoms. In infants, precision was high for the assessment of body fat, lean mass, and total body water.

T-209-P

Evaluation of Clinical Measures of Severe Obesity in Youth

Sarah E. Barlow, Ronan Shypailo, Benedetta McQueen Houston, TX; Aaron S. Kelly Minneapolis, MN

Background: To evaluate usefulness across the age range of clinical methods to express degree of excess weight among severely obese youth, we examined the relationship of body fat with four BMI-based measures. Methods: 614 obese youth ages 5 to 17 years (60% Hispanic, 26% Black, 10% White, 5% other) underwent body composition assessment via air-displacement plethysmography. Included were 82 5-7 year olds (BMI = 27.2 ± 4.1 kg/m2), 183 8-10 years olds (BMI = 31 ± 2.5 kg/m2), 216 11-13 year olds (BMI = 34.6 ± 6.3 kg/m2) and 133 14-17 year olds (BMI = 39.9 ± 7.5 kg/m2). A prediction equation estimated lung capacity, and the Lehnman equation was used to calculate percent body fat (%fat). Stepwise multiple regression models in boys and girls examined %fat as a function of race-ethnicity, age, and each BMI parameter: BMI, BMI percentile (BMI %ile), BMI z-score (BMZ), and percent above the 95th percentile BMI (%>95th).

Results: Among boys, adjusted R2 (ar2) was higher for BMI (0.44) and %>95th (0.44), compared with BMZ (0.25) and BMZ%ile (0.21). Standard error of estimate (SEE) ranged from 4.96 to 5.94. Among girls, the ar2 values for the 4 models were similar: BMI = 0.54, %>95th = 0.35, BMZ = 0.53, BMI%ile = 0.44. SEE ranged from 4.02 to 4.50. Among boys, age was not a significant covariate in BMI%ile and %>95th models; however among girls, age was a significant covariate in all the models. Among boys race-ethnicity was significant in all models except BMI%ile, and among girls race-ethnicity was not significant in any of the model. Conclusions: For boys, %>95th had the best predictive value for %fat and had no age interaction. For girls, age interaction occurred with %>95th but also with the other models. Therefore, %>95th may be a useful BMI-based method to estimate %fat among obese children and adolescents in the clinical setting.

T-210-P

Positive Approaches in the Prevention of Childhood Obesity: A Proactive Method for Teaching Nutrition in a Preschool Classroom Setting

Debra K. Goodwin, Jill F. Marsh. Jacksonville, AL

Background: This study tested benefits of a five-week age-appropriate nutrition education program directed toward children aged 3 to 5 years in a preschool setting. Methods: Fourteen pre-schoolchildren aged 3-5 years participated in a five-week nutrition education program introduced in the form of age-appropriate stories and puppetry. To determine if the program had an appreciable effect on children’s intake, a grocery store activity was conducted using a classic pretest-posttest design. In this activity, a grocery store was designed containing a wide variety of both healthy and unhealthy foods. Prior to participating in the program, the children went “shopping” in the mock grocery store and were instructed to select five items. After the education program, the grocery store activity was repeated, with the children again instructed to choose five items. Children’s food and beverage selections of the pretest and posttest activities were compared in terms of calories, fat, protein, sugar, and servings of fruits and vegetables selected. Results: Findings indicated that all of the children (n=14) in this study made at least one positive change (e.g., reduced calories, decreased fat, or increased the numbers of fruits and vegetables) in their food choices. More specifically, posttest findings included a 20% reduction in calories, a 63% reduction in fat, a 24% increase in sugars, and greater than a 200% increase in the servings of fruits and vegetables. Conclusions: Overall, the results of this small pilot study are promising and suggest that the program may be effective with regard to improving the food choices of young children.

T-211-P

The Impact of Inpatient Pediatric Weight Management Program

Sharonda J. Alston Taylor, Kimberly Rennie, Cindy Jon Houston, TX

Background: Childhood obesity treatment options include medical management with a multidisciplinary team, pharmacotherapy and surgery. Pharmaceutical options are limited and few qualify for bariatric surgery. A treatment alternative is necessary; therefore an inpatient obesity program was created. The purpose of this project was to evaluate the effectiveness of a medically supervised inpatient weight management program. Methods: This is a retrospective chart review of 21 patients discharged from an inpatient pediatric weight management program from October 2011 through December 31, 2012. Inclusion criterion for chart review was a minimum stay of 28 days. Of the 21 patients admitted to the program, 3 stayed of less than 28 days and were not included in analyses. Admission criteria were age 2-21 years and (a) BMI of >95th percentile with a one medical comorbidity or (b) BMI > 40 without comorbidities. Results: The average patient was 13 years (4-18), had a BMI of 49.8 (32.4-85.4), stayed 75.7 days, achieved 15% weight loss and decreased systolic and diastolic blood pressure (10mmHG and 8mmHg, respectively). Upon admission, 27.8% (n=5) met criteria of a depressive disorder and 11.1% (n=2) for an anxiety based disorder. At discharge, only 1 met criteria for a depressive disorder and 1 continued to meet criteria for an anxiety based disorder. Improvements in comorbidities such as diabetes, obstructive sleep apnea, and exercise tolerance were also observed. Conclusions: Inpatient pediatric weight management leads to successful weight loss and improvement in comorbidities and a reduction in mental health diagnoses.
**T-212-P**
Formalized Assessment of Adolescent Motivation for Weight Change Behaviors
Beth H. Garland, Elisabeth S. Hastings, Sharonda J. Alston Taylor, Rachael S. White, Constance M. Wiemann Houston, TX

**Background:** Adolescent motivation for weight management is a commonly cited psychological variable when treating obesity. Many of the published guidelines support health care professionals assessing motivation/readiness for change. However, limited information exists in specific methods for assessing motivation. Several theoretical papers suggest utilizing the Motivational Interviewing rulerets where a patient provides a numerical response and justification for perceived confidence and the importance of the change. While a valuable clinical tool for a collaborative environment, these methods have not been empirically studied. In addition, only one measure of motivation has been tested with adolescents in a clinical sample. Formally assessing motivation with validated measures would allow for improved understanding of a patient’s journey to change, monitoring change over time, and accurately predicting the role of motivation in behavior change. This poster evaluates the reliability and factor structure of three published measures of motivation in an adolescent sample seeking treatment for weight management.

**Methods:** Participants were 118 adolescents between the ages of 12-18, who participated in a behavioral weight management group program. Baseline measures included Diet Readiness Test(DRT), University of Rhode Island Change Assessment (URICA), and the Weight Efficacy Lifestyle (WEL).

**Results:** Internal consistency was moderate to excellent (α=0.68-0.87) for the URICA and WEL. Two scales on the DRT did not perform as reliably. Age differences in internal consistency were noted for the WEL and DRT between younger/older adolescents. Exploratory factor analyses suggested modifications to the original factor structure of the URICA. **Conclusions:** Discussion will provide recommendations for modeling motivation in clinical studies as well as in clinical practice.

**T-213-P**
Physical Health Outcomes of Children and Teens Enrolled in the Healthy Ways Clinic
Nicole F. Swain Akron, OH; Charlotte Sutton, Sarah White, Linda Dyer, Jan Simpson 2018 Clinica Avenue, TN

**Background:** Pediatric obesity has been found to increase a child’s vulnerability to many health comorbidities such as cardiovascular disease and diabetes. In an attempt to minimize these detrimental health outcomes, many have implemented various types of interventions to help reduce pediatric obesity.

**Methods:** The purpose of the current study is to present preliminary findings from The Healthy Ways Clinic at East Tennessee Children’s Hospital, a hospital-based outpatient family-focused pediatric weight management program. Data was collected at baseline and at the 16 week re-assessment.

**Results:** A total of 212 patients (age 3-19; 57% female) were assessed at baseline. 108 patients completed the 16 week program and were re-assessed at that time. Repeat lab values at 16 weeks were done if medically indicated. Findings suggest significant differences from baseline to the 16-week re-assessment in triglycerides, insulin, and total cholesterol, with all lab values showing a significant decrease at 16 weeks. There were also significant differences in BMI change, waist measurement, and waist/hip ratio (in the 8-12 year old group only) with all improving at 16 weeks (all p<.05).

No significant changes were found in heart rate, blood pressure, HDL, or LDL labs. **Conclusions:** Although there was no control group in which to compare these results, these outcomes are encouraging. Several risk factors for long-term physical health problems such as cardiovascular disease and diabetes were significantly reduced at the 16 week re-assessment. These preliminary findings suggest programs such as the Healthy Ways Clinic are crucial in teaching more appropriate lifestyle changes that can positively impact a child’s long-term development.

**T-214-P**
Long-Term Changes in Body Fat Percentage Associated with Overweight Youth’s Participation in Camp Strong4Life
Lauren Lorenzo, Jean A. Wells, Farrah Keong, Cristina Milone, Stephanie Walsh, Laura Colbert Atlanta, GA

**Background:** Camp Strong4Life is a summer camp program designed to promote healthy dietary habits among participating campers and their parents through education and positive role modeling in a fun and supportive environment. Our purpose was to determine if participation in Camp Strong4Life was associated with sustained changes in campers’ percent body fat.

**Methods:** In 2012, 67 overweight youth (BMI > 85th percentile) age 9 to 15 years (mean age 12.2 years) participated in the Camp SAL program including: Family Welcome Weekend (spring; baseline visit), Camper Week (summer; youth only), and Family Reunion Weekend (fall; follow-up visit #1). Body fat percentage was assessed using Air Displacement Plethysmography (Bodpod) for a randomly selected subsample of 11 campers at baseline, Reunion Weekend (3-6 months after baseline), and again at a second follow-up visit (9-13 months after baseline). Change in body fat was determined using longitudinal mixed models. **Results:** Between baseline and follow-up #1, mean body fat decreased from 42.4% to 38.1% (Δ=-4.3%; p<0.003). This decrease was maintained but did not increase further after participation in the camp program had ended, between follow-up visits #1 and #2, (body fat 37.2%; Δ=-0.97, p=0.64). Over the full 9 to 13 month follow-up period, mean body fat percentage decreased by 5.2% among campers. This decrease approached statistical significance (p<0.09). **Conclusions:** These findings suggest that participation in Camp Strong4Life was associated with a sustained decrease in body fat. Further study using a randomized controlled design is needed to confirm these findings.

**T-215-P**
Short and Long-Term Impact of a Weight Management Summer Camp, Kamp K’aana
Alicia E. Farhat, Shreela Sharma, Stephanie H. Abrams, William W. Wong, Sarah E. Barlow Houston, TX

**Background:** This study assessed the short and long-term effects of Kamp K’aana, a 2-week residential camp, on weight, body mass index (BMI), BMI percentile, and BMI z-score on obese youth.

**Methods:** 108 10-14 year old obese youth enrolled in the 2-week Kamp K’aana program, which provided an 1800 kcal/day meal plan, recreational physical activities, and nutrition and behavioral lessons. Weight and height were measured at start and end of camp. We examined the outcomes of 71 (66%) subjects who had long-term measures, from either the 11-month reunion (n=39) or clinical visits within 3 months of reunion measure (n=32). Subjects were 11.9 ± 1.4 years, 23 (32%) were Hispanic, and 34 (48%) were boys. ANCOVA adjusting for age, gender, and ethnicity was used to assess changes in weight, BMI, BMI percentiles and BMI z-scores from pre-camp to 2-weeks and long-term. Sign test was used to evaluate proportion of campers who had a decrease in BMI z-score of at least 0.2. **Results:** Significant reductions were observed at the end of the 2-week camp in body weight (85.0 ± 18.6 kg vs. 81.4 ± 17.9 kg; p < 0.001), BMI (33.6 ± 5.8 kg/m2 vs. 32.3 ± 5.8 kg/m2; p < 0.001), BMI percentile (98.7 ± 10 vs. 98.2 ± 1.5; p < 0.001), and BMI z-score (2.34 ± 0.30 vs. 2.24 ± 0.34; p < 0.001). At the long-term measure, weight and BMI increased (p < 0.001) from baseline, but BMI percentile decreased to 97.3 ± 6.7 (p < 0.001), and BMI z-score decreased to 2.23 ± 0.49 (p < 0.001). A decrease in BMI z-score of at least 0.2 was seen in 14 youth (20%) at 3 months (p < 0.001) and 19 (27%) long-term (p < 0.001). **Conclusions:** Participants of the 2-week Kamp K’aana program had not only short-term improvement in weight, BMI, BMI percentile and z-score but also sustained improvement in BMI percentile and z-score over ~11 months.

**T-216-P**
Family-Based Motivational Interviewing and Community Resources Mobilization to Improve BMI in Low-Income Families with Children
Helena H. Laroche Iowa City, IA; Bery Engebretsen Des Moines, IA; Jennifer Park-Mroch Iowa City, IA

**Background:** Low-income populations have a high-risk of obesity and encounter resource barriers to improving diet and exercise. Children of obese adults are at high risk for obesity. **Methods:** This community-based participatory research pilot intervention focuses on low-income families with children in the home under 18 years where one parent is obese. This intervention combines joint motivational interviewing with parents and any older children to develop family-focused diet and exercise goals and help accessing existing community resources (e.g. nutrition classes, fruits and vegetables, written materials, WIC, heating assistance, exercise resources) to assist families in making healthy lifestyle changes. This is facilitated by a partnership of organizations including a community health center, university extension educations.
Obesity measurements were done by study personnel. Results: After 6 months, 20 families showed the following changes. The obese adult’s BMI average change was -0.80 (p<0.04). Among 12 adults with diabetes, their HbA1c levels on average dropped 1.6 points (p=0.05). For children who were over the 85th BMI percentile at baseline, 15% increased, 20% maintained and 20% decreased their BMI percentile. For children under the 85th percentile, 5% increased their BMI percentile to over 85th percentile, 20% increased but remained under the 85th percentile, 15% maintained and 5% decreased their BMI percentile. Score on the Family Nutritional and Physical Activity Scale which predicts risk of obesity showed a significant change from an average score of 54.7 at baseline to 60.4 (P<0.001). Conclusions: Motivational interviewing combined with assistance accessing community resources shows promise to help high-risk low-income families with children make healthy lifestyle changes to prevent obesity.

T-217-P Dietary Composition and Micronutrient Adequacy among Overweight Boys and Girls Participating in a School Nurse-Delivered Weight Management Intervention
Nicole M. Wedick, Barbara Olendzki, Susan Druker Worcester, MA; Mary Ann Gapsinski Boston, MA; Robert Magner Worcester, MA; Stavroula Osmian Boston, MA; Kristin Schneider Chicago, IL; Lori Pbert Worcester, MA

Background: Few data have been published on the macro- and micronutrient adequacy among overweight children. The objectives of this investigation were to examine adolescent nutrient intake in comparison to the USDA’s dietary guidelines for boys and girls aged 14-18 years, and to evaluate changes in nutrient intake during a school-nurse-delivered intervention. Methods: We conducted a secondary analysis using 24-hour dietary recall data collected at baseline, 2-month, and 6-month visits for 79 overweight/obese adolescents. Linear mixed models treating student and school as random effects were used to examine differences by gender and timepoint for macro- and micronutrients, adjusting for total energy intake and intervention. Results: The mean age of participants was 15.8 years. Mean BMI was 31.9 kg/m2 and 68% were obese (BMI percentile ≥95%). Compared to the USDA’s dietary guidelines, carbohydrate, protein and fat fell within the recommended ranges. Micronutrient inadequacy was observed among both boys and girls for calcium, magnesium, phosphorus, potassium and all fat soluble vitamins. Iron was especially low for girls (9.7mg/d versus guidelines 15mg/d). Significant differences were observed by gender with boys having higher intakes of protein, iron, potassium, sodium, zinc and all B-vitamins even after adjustment for total caloric intake. Nutrient intake did not significantly change over time for most of the nutrients. Conclusions: Among overweight and obese adolescents, we observed low intakes of key vitamins and minerals important for adolescent growth and overall health. Larger studies in diverse adolescent populations are warranted to investigate the prevalence and trends over time for energy-dense nutrient-poor diets. NCT# 00682188

T-218-P Intake at a Single, Palatable Buffet Test Meal Is Associated with Body Composition in 4- to 6-Year-Old Children
Stephanie N. Fearnbach, Laural K. English, Wendy M. Stein, Terri L. Cravener, Kathleen L. Keller University Park, PA

Background: Single-meal studies of intake offer greater experimental control than measures like food frequency questionnaires, but have been criticized for not being representative of consumption under free living conditions. The purpose of this study was to determine the association between intake at a single-session, palatable buffet meal and children’s body composition. Methods: A sample of children (n=72, mean age±SD, 5.5±0.82 years) participated in a single session where they consumed ad libitum from a highly palatable buffet meal, containing sweets (e.g. fruit candies), sweet-fats (e.g. brownies), and savory-fats (e.g. cheese sticks). Body composition was measured by dual-energy X-ray absorptiometry and used as a proxy for tendency to overeat. Secondary analyses are reported using partial correlations and linear regression to examine the association between body composition and intake measures, controlling for child age and sex. Results: Total intake was positively associated with percent body fat (p<0.001), but negatively associated with percent lean mass (p<0.001). Percent body fat was positively associated with intake from savory-fats (p<0.001), but not associated with intake from sweets (p=0.33) or sweet-fats (p=0.43). Regression analyses revealed that android fat percentage was more predictive of total intake (r2=0.28, p<0.001) than gynoid fat percentage (r2=0.19, p=0.002) or percent body fat (r2=0.24, p<0.001). Android fat percentage was positively associated with intake from savory-fats (p<0.001), but not associated with intake from sweets (p=0.43) or sweet-fats (p=0.27). Conclusions: Children’s body composition, specifically greater android fat, was a strong predictor of intake at a single-session test meal made up of highly palatable foods. Single-meal studies that use highly palatable foods may be valid measures of tendency to overeat.

T-219-P Infant Body Composition Analysis by Dual-Energy X-Ray Absorptiometry: Comparison of Two Fan-Beam Instruments Using a Solid Anthropomorphic Infant Phantom
Roman Shypialo Houston, TX; David A. Fields Oklahoma City, OK

Background: Dual energy X-ray absorptiometry (DXA) is used to study infant body composition though little is known about its validity, reliability and precision in an infant population. Differences between manufacturers (Hologic and GE) remain unclear, potentially causing problems in multicenter/longitudinal studies. The purpose of this study was to compare infant scans from different DXA manufacturers at two sites to evaluate precision, agreement and to produce estimated cross-calibration factors. Methods: Two sites scanned a solid phantom resembling a 7 kg human infant in body habitats on two DXA instruments, 30 times per scan mode: Hologic infant mode (HOL, Bedford, MA; Delphi v12.1; Baylor College of Medicine site); Lunar infant and thin modes (LUN, Fairfield, CT; iDXA v11.30.062; Oklahoma Health Sciences site). We compared results between devices and scan modes for fat and lean mass and bone mineral (BMC). Results: HOL CV for BMC=3.8%, lean=2.5% and fat=5.6%. LUN had better precision (CV<1% for BMC, lean and fat for both modes) with the infant mode having lower precision than the thin mode. All scan modes (LUN infant and thin, HOL infant) differed significantly for BMC and lean mass (p<0.0001). Fat differed between LUN and HOL only (p<0.0001). Absolute differences between LUN modes were small. HOL BMC > LUN BMC by 15%; HOL lean > LUN lean by 6%; HOL fat > HOL fat by 5%. HOL results, relative to anticipated phantom values, overestimated fat (+30%) and underestimated BMC (-12%) and lean (-5%), while both LUN modes overestimated fat (+40%) and underestimated BMC (-14%) and lean (-11%). Conclusions: Infant DXA scans done on different manufacturers’ instruments are not interchangeable. Although approximately correctable using these comparison results, additional phantoms spanning a range of sizes are needed in order to generate more robust correction algorithms.

T-220-P Obese by Nature or Practice? Child Lay Theories About Body Weight and Health Habits
Julie Dunsmore, Leanna Berrey Blacksburg, VA; David Berry Blacksburg, VA; Madelyn Frisard Blacksburg, VA

Background: Childhood obesity is increasingly recognized as a major health problem in the United States. Despite the availability of multi-pronged intervention programs, lifestyle change is difficult. Obesity rates have remained steady since 2007. Identifying factors to promote adherence to the challenging task of changing lifestyle habits is a novel and necessary approach to weight loss interventions. Research in other fields robustly demonstrates that beliefs that personal characteristics are fixed (entity lay theories) lead to decreased motivation when facing challenges, whereas beliefs that personal characteristics are changeable (incremental lay theories) lead to increased motivation when facing challenges and to better long-term performance. Viewing body weight as changeable may determine families’ choice to participate in intervention programs and their response to setbacks while participating in the program. Methods: This study is the first to examine child lay theories about body weight and health habits. Twenty-six parent-child dyads (children aged 8 to 12 years, M age = 9.73 years, SD = 1.37; 57.1% girls) BMI-for-age 14 to 21; BMI-for-age percentiles 3 to 91, M = 45.43, SD = 26.07) completed measures of diet, physical activity, and lay theories. Results: Correlations showed that child incremental lay theories were associated with healthier diet (i.e., greater protein, fruits & vegetables intake; ps < .01). Regressions showed that these associations held even after accounting for parental diet and physical activity predictors (ps < .05). Conclusions:
Results from the current study suggest that promoting children’s incremental beliefs about weight and health habits may be beneficial for weight management program adherence and health.

T-221-P

Hip Strength and Standing Alignment Are Associated with Knee Valgus During Activity in Obese Children
Matthew S. Briggs, Tom M. Best, Shamout Tabakhu, Ajit M. Chaudhari, Colleen Spees, Laura A. Schmitt Columbus, OH

Background: Obese children demonstrate increased knee valgus during activity compared to healthy weight children, however contributing factors remain unclear. The aims of this study were to 1) Compare hip strength and knee valgus in obese and healthy weight children and 2) evaluate for correlations of hip strength and standing knee alignment to knee valgus during dynamic activity. Methods: Children (ages 11-18) were categorized into two matched groups: obese (OB) [n=9, age: 13.67±2.24, gender: 6M:3F, BMI Z score: 1.95±.18] and healthy weight (HW) [n=9, age: 13.78±2.11, gender: 6M:3F, BMI Z score: 11±.77]. Right isometric hip extension (EXT) and abduction (ABD) strength were measured. Right knee valgus angle [°] was measured during static bilateral standing alignment (STSC). Peak right knee valgus angle was evaluated during the weight acceptance phase of walking (WALK) and jogging (JOG). Paired T-tests and Pearson’s Correlations Coefficients were used to evaluate group differences and correlations.

Results: OB children demonstrated lower EXT (988±46Nm/kg vs. 1.65±.45Nm/kg, p<.008) and lower ABD (7.6±.40Nm/kg vs. 1.11±.20Nm/kg, p<.03) and demonstrated greater knee valgus during STATIC (5.49±3.54° vs. 503±2.29°, p=.02), WALK (5.39±3.56° vs. 214±2.93°, p=.03) and JOG (6.47±4.59° vs. 604±3.35°, p<.02), ABD, but not EXT, in the OB group correlated with knee valgus during WALK (r=-.817, p=.007) and JOG (r=-.792, p=.01). Right knee valgus angle during STSC correlated with knee valgus during WALK (OB: r=-.978, p<.001; HW: r=-.858, p=.003) and JOG (OB: r=-.817, p=.007; HW: r=.792, p=.02). Conclusions: OB children have less relative hip strength and greater knee valgus. Hip strength and standing alignment may potentially contribute to knee valgus during dynamic activity in OB children.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Surgical Treatment of Obesity

T-222-P

Validity of Bioelectrical Impedance Analysis (Tanita 310) to Estimate Changes in Total Body Water and Percent Body Fat Following Bariatric Surgery
Elizabeth Widen, Gladys W. Strain New York, NY; Wendy C. King Pittsburgh, PA; Wenren Wu, Susan Lin New York, NY; Brent H. Goodpaster Pittsburgh, PA; John C. Thornton New York, NY, Anita P. Courcoulas Pittsburgh, PA; Alfons Pomp, Dymnna Gallagher New York, NY

Background: Bioelectrical impedance analysis (BIA) is an inexpensive, rapid and non-invasive method to estimate body composition; however, few studies have validated BIA in severely obese adults and following substantial weight loss by bariatric surgery. Methods: We examined the validity of BIA to assess body composition before (T0) and 12 months (T12) after bariatric surgery (72% Roux-en-Y, 28% Other), and change between time points in a subset of participants (n=32) of the Longitudinal Assessment of Bariatric Surgery (72% Roux-en-Y, 28% Other), and change between time points in a subset of participants (n=32) of the Longitudinal Assessment of Bariatric Surgery. Criterion measures were total body water (TBW) determined by deuterium dilution, and percent fat (%fat) calculated with the three-compartment model (3C) (Silva et al., 2004) using deuterium TBW and BodPod determined body volume. BIA TBW and %fat were measured with the Tanita 310. Results: T0 to T12 changes in deuterium TBW and 3C %fat were -6±5 L (-14.4%), and -16 ± 9 (-30.5%), respectively. There was no significant difference between BIA and deuterium TBW [T0: 1.2 L (2.4%), p<.02; T12: 0.1 L (0.008%), p<.08; A: -1.1 L (17.7%), p<.03]. Compared to 3C, BIA significantly underestimated %fat at T0 and T12 [T0: -3.9 (7.4%), p<.001; T12: -1.9 (5.3%), p<.04] and significantly overestimated change [2.0 (12.7%), p<.04]. Bland Altman plots showed most estimates of BIA TBW (31-32 of 32) and %fat (30-31 of 32) were within 95% limits of agreement with criterion measures at T0, T12 and change. There was no evidence of a fixed bias, i.e., differences between BIA and criterion methods were not related to average values. Conclusions: BIA estimates of TBW have good agreement with deuterium dilution. While BIA %fat values differed significantly from 3C values, Bland Altman plots indicated acceptable agreement. Revised BIA equations to estimate % fat in this population may be warranted.
weight loss and greater improvements in some cardiovascular risk factors. However, duodenal switch was associated with more adverse events.

T-225-P
Problematic Pre-Surgical Intake of High-Sugar/Low-Fat and High Glycemic Index Foods is Associated with Development of Post-Surgical Substance Use Disorders
Lauren A. Fowler, Karen K. Saules Canton, MI; Valentina Ivezaj New Haven, CT
Background: It has been documented that post-bariatric surgery patients, particularly those who have had the Roux-en-Y procedure, are overrepresented in substance abuse treatment, constituting about 3% of admissions; about 2/3 of such patients deny problematic substance use prior to their weight loss surgery (Ivezaj et al., 2012; Saules et al., 2010; Wiedemann et al., under review). Therefore, it is important to advance our understanding of the emergence of substance use disorders (SUDs) — particularly the New Onset variant — after bariatric surgery. Burgeoning research with both animal models and humans suggests that “food addiction” may play a role in certain forms of obesity (Avena & Gold, 2011; McFadden, 2010), with particular risk conferred by foods high in sugar but low in fat. Therefore, we hypothesized that bariatric surgery patients who report that high-sugar/low-fat foods, and perhaps those high on the Glycemic Index, were most problematic for them before surgery would be those most likely to evidence New Onset SUDs after surgery. Methods: Secondary data analyses were conducted using a de-identified database from 154 bariatric surgery patients (88% female, mean age of 48.7 and standard deviation of 10.8, mean of 2.7 yrs post-surgery and standard deviation of 2.2). Results: Logistic regression analyses revealed that participants who endorsed pre-surgical problems with high-sugar/low-fat foods and those high on the glycemic index were at greater risk for New Onset SUD in the post-surgical period. These findings remained significant after controlling for other predictors of post-surgical SUD.

Conclusions: Our findings provide evidence for the possibility of addiction transfer among certain bariatric patients.

T-226-P
A Brief Physical Activity Intervention Improves Preoperative Health-Related Quality of Life in Bariatric Surgery Patients: Results from the Bari-Active Randomized Controlled Trial
Dale S. Bond, Graham Thomas Providence, RI; Wendy C. King Pittsburgh, PA; Jennifer Trautvetter, Sivananthan Vithiananthan, Dieter Pohl, Jeanneinne Giovanni, Beth Ryder, Dean Roye, Rena R. Wing Providence, RI
Background: Improved Health-Related Quality of Life (HRQoL), an important goal of bariatric surgery programs, may be undermined by low physical activity (PA). The current study tested the impact of a preoperative PA intervention on HRQoL. Methods: Participants (n=51, 88% women, age=47.2±9.0 yr, BMI=45.1±8.1) were randomly assigned preoperatively to 6 wks of PA intervention (PAI) or standard care (SC). PAI received weekly individual counseling to increase walking by 30 min/d in bouts ≥10 min. SC attended routine clinical visits only. Participants wore a multi-sensor monitor for 7 d and completed the SF-36 at pre- and post-intervention to measure changes in moderate-to-vigorous PA (MVPA) bout-related min/d and HRQoL, respectively. Results: PAI significantly increased bout-related MVPA from pre- to post-intervention (4.4±5.8 to 25.9±2.3 min/d), compared to no change (9.6±19.1 to 8.9±12.3 min/d) in SC (p=0.001). Weight change did not occur in either group. PAI reported greater improvements than SC on SF-36 domains (physical function (PF): 4.4±7.1 vs. 0.9±6.5), bodily pain (BP; 3.4±5.8 vs. 2.6±4.0), general health (GH; 4.2±8.2 vs. -0.2±8.1), vitality (VT; 5.8±8.2 vs. 2.2±6.8)), and the physical component summary (PCS; 4.8±8.1 vs. 2.4±7.2) (p’s<0.05). In PAI, greater bout-related MVPA increases were related to greater PF (p=0.03), role-physical (RP; p=0.04), and BP (p=0.02) improvements, controlling for age, sex, BMI, and pre-intervention MVPA and SF-36 values. In this model, for every 10-min/d increase in bout-related MVPA, there was a 1.9 point increase in PCS score (p=0.01). Conclusions: Increasing PA improves physical aspects of HRQoL in bariatric surgery patients before surgery and weight loss occurs. Future studies should examine whether this effect improves surgical safety, weight loss outcomes and postoperative improvements in HRQoL.

T-227-P
Are Mortality Benefits of Gastric Bypass Surgery Influenced by the Patient’s Age at Surgery?
Lance E. Davidson, Ted D. Adams, Richard E. Gress, Sherman Smith, Steven C. Simper, Rodrick McKinlay, Steven C. Hunt Salt Lake City, UT
Background: Several large epidemiological studies have demonstrated an all-cause and cardiovascular disease mortality benefit after bariatric surgery. Bariatric surgery is currently offered as a treatment option to adult patients of all ages. Whether or not reduced mortality risk extends to all age groups is not yet known. Methods: In an existing retrospective cohort of 9949 gastric bypass surgery patients and 9628 age-, sex-, and weight-matched severely obese controls, we determined the mortality rates of cardiovascular disease, cancer, and all causes using the National Death Index. Categories of age at surgery were created: <35, 35-44, 45-54, and 55+ years with a mean follow-up period of 7.1 years. Results: Adjusted all-cause mortality was higher for younger post-surgery patients than for severely obese controls (HR: 1.52, p=0.01), but lower within all subsequent age categories (HR: 0.64, 0.41, and 0.45, respectively; all p<0.001). External causes (accidents, poisonings, suicides, etc.) alone accounted for the increased mortality risk observed in younger surgical patients (with external causes removed, HR reduced from 1.52 to 1.06, p=0.80). Cardiovascular mortality rates were lower in surgery patients (HR: 0.81, 0.39, 0.38, 0.69, p=0.005 for middle age groups only). Cancer mortality rates were lower than controls across all age categories (HR: 0.13, 0.54, 0.42, 0.37, all p<0.00). Conclusions: Gastric bypass surgery appears to be protective against cardiovascular and cancer mortality for all age groups. With the exception of increased externally-caused mortality in younger patients, gastric bypass surgery also significantly reduces all-cause mortality rates. Further investigations should target prevention of external causes of death in younger gastric bypass patients after surgery.

T-228-P
Suicide Risk in Gastric Bypass Patients Relative to a Non-Surgery Comparison Group and Population Controls
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Background: Recent epidemiological studies report higher rates of accidental death and suicide for those who have undergone gastric bypass surgery. To date, no study has examined whether gastric bypass patients report higher suicide thoughts and planning (suicidality) relative to well-matched comparison groups. Methods: This study reports Exam 4 data (10-year follow-up) from a large cohort (n=1156) who either did or did not receive bariatric surgery and population controls. Of those, 146 participants (~49/group) have completed the current assessment. Results: Relative to both comparison groups, those who received surgery reported higher suicidality (F(2,89)=3.22, p=0.04). This finding remained significant with concurrent depression in the model (p=0.02) and approached significance controlling for both depression and weight-related distress (p=0.06). To test whether suicidality was due to longstanding psychological problems we tested whether Exam 1 psychological wellbeing negatively predicted Exam 4 suicidality, mediated by concurrent depressive symptoms and moderated by group (surgery vs. not). Results were consistent with full mediation (F(3,83)=8.5, p<0.001). Group status did not moderate the association between early psychological wellbeing and later suicidality, which was significant for all groups (t=-3.6, p<0.005). However, the association between depression and suicidality was strongest for those who had received surgery (t=2.6, p=0.01). Conclusions: Across all groups there was stability of psychological distress over time. However, the association between depression and suicidality is strongest for those who received gastric bypass surgery, even when early psychological well-being is accounted for. This suggests a strong need to assess suicide risk routinely among bariatric surgery patients who are depressed.
T-229-P
Phase III, Randomized, Placebo-Controlled Evaluation of Ferumoxytol Treatment for Iron Deficiency Anemia in Patients Who Have a History of Unsatisfactory Oral Iron Therapy: Fatigue and Health-Related Quality of Life in Gastric Bypass Patients
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Background: Iron is essential for the function of key proteins including hemoglobin (Hgb), cytochromes, and various enzymes. Therefore, iron deficiency can negatively impact patients’ health-related quality of life (HRQOL). Iron deficiency anemia (IDA) is common in patients after gastric bypass due to malabsorption. However, many patients do not tolerate or adequately respond to oral iron; those patients live with chronic anemia and related negative effects on HRQOL. Methods: To explore the impact of intravenous iron treatment on patient reported outcomes in IDA patients with a history of unsatisfactory oral iron therapy or in whom oral iron cannot be used, this randomized, placebo-controlled, double-blind, Phase 3 study included Functional Assessment of Chronic Illness Therapy-Fatigue Scale (FACT-F) and the SF-36. Patients (808) were randomized 3:1 to 1 g of ferumoxytol (FER, 2 doses, 510mg, 3-8 days apart) or saline placebo (PL). FACT-F was assessed at Baseline (BL) and weekly for 5 weeks; SF-36 was assessed at BL and Weeks 3 and 5. This subgroup analysis investigates patients with gastric bypass history. Results: Patients’ BL FACT-F scores (FER, n=64, 20.2; PL, n=30, 20.6) were much lower than general US population norms (40.1), as were all BL SF-36 domains (FER, 34.1-44.4; PL, 33.0-46.7; general population, 50). Mean Hgb increased in FER patients by 3.1 g/dL, from BL to Week 5, vs. a -0.1 g/dL decrease with PL (p<0.0001). In parallel, FER patients showed a significantly greater improvement in FACT-F than PL at Week 3 (13.0 vs 7.8, p=0.036) and Week 5 (14.0 vs 8.9, p=0.036). FER patients also showed a significantly greater improvement than PL in three SF-36 domains (p<0.05) from BL to Week 5. Conclusions: This analysis found that FER treatment increased Hgb and significantly improved HRQOL in IDA gastric bypass patients with history of unsuccessful oral iron.

T-230-P
Three-Year Physical Activity Trajectories and Predictors of Trajectory Class Membership in Bariatric Surgery Patients
Wendy C. King, Jia-Yuh Chen Pittsburgh, PA; David R. Flum Seattle, WA; Gregory Dakin New York, NY; James Mitchell, Brian Cook Fargo, ND; Bruce M. Wolfe Portland, OR; George Eid Pittsburgh, PA

Background: Understanding how and identifying predictors of physical activity (PA) changes following bariatric surgery are critical to assessing the need for and planning effective interventions. Methods: We examined 3 year longitudinal trajectories of PA in a subset of participants of the Longitudinal Assessment of Bariatric Surgery-2 study (n=470; 79% female, 89% white, median age 47y, median BMI=45kg/m2, 70% Roux-en-Y) and determined Assessment of Bariatric Surgery-2 study (n=470; 79% female, 89% white, median age 47y, median BMI=45kg/m2, 70% Roux-en-Y) and determined. Thirty-five PA values (9-12 variables per year, 75.6% female, 71.9% White; Mage=17.1; MdnBMI = 50.5kg/m2). Standardized criterion defined the presence/absence of 14 comorbid conditions, including elevated depressive symptoms (DEP; BDI), binge eating disorder (BED;QEWP) and HRQOL (SF36) and HRQOL (IWQOL-Kids). A cumulative Comorbidity Index (CI) was computed for males (Mdn=4.3; range 1-8) and females (Mdn=3.9; range 0-9). Results: The most prevalent comorbidities were dyslipidemia (74.4%), chronic pain (59.3%), obstructive sleep apnea (56.6%), hypertension (45.0%), and PCOS/menstrual irregularities (43.2%), relative to BED (15.4%) and DEP (14%). Gender-stratified, multivariable regression revealed CI was associated with only male WROQOL. For males and females, BMI, chronic pain, and DEP, as well as BED for females, were significant predictors beyond the CI, although varied by HRQOL/WROQOL scale. Exploratory analyses suggest additional less prevalent conditions (e.g., stress urinary incontinence) also contributed to HRQOL/WROQOL impairment. Conclusions: Severe excess weight and associated comorbidities significantly impact adolescent HRQOL/WROQOL. While several indicated factors may resolve with weight loss (e.g., chronic pain, total comorbidity burden), others (e.g., DEP) may not without targeted intervention. This comprehensive characterization establishes an empirical base from which to understand HRQOL/WROQOL postoperatively, as weight and comorbidity profiles change over time.

T-231-P
Cognitive Function Predicts Weight Loss 36 Months Following Bariatric Surgery
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Background: Cognitive impairment is found in many patients undergoing bariatric surgery. Past research demonstrates that cognitive dysfunction is associated with reduced postoperative weight loss up to 24 months following surgery. We extend these findings by examining contribution of cognitive function to weight loss durability 36 months following surgery. Methods: Fifty-five individuals enrolled in the Longitudinal Assessment of Bariatric Surgery parent project completed cognitive testing at preoperative baseline and serial postoperative timepoints, including 12 weeks and 36 months. Cognitive test scores were normed to control for intelligence and demographic variables. Percent weight loss (%WL) and body mass index (BMI) were calculated at 36 month follow-up. Results: Adjusting for gender, baseline global cognitive function, and 12-week %WL, 12 week postoperative global cognition predicted 36 month postoperative %WL (β=-.47, p<.03) and 36 month BMI (β=-.55, p<.01). Independent samples t-tests comparing 12 week postoperative cognition in those who remained obese at 36 months (54.5%) versus non-obese revealed poorer global cognitive function in those who remained obese (t(53)=-2.12, p<.04). Recognition memory, working memory, and semantic fluency showed the strongest link between cognitive performance and 36 month weight loss. Conclusions: Poorer cognitive function 12 weeks after bariatric surgery predicted reduced weight loss outcomes 36 months following surgery. Further work is necessary to clarify the mechanisms underlying the relationship between weight loss outcomes and cognitive function, particularly the contribution of adherence, as this approach may ultimately help identify individuals in need of tailored interventions to optimize postoperative weight loss.

T-232-P
Teen-LABS: Severe Obesity, Comorbidity Burden and Adolescent Quality of Life
The Teen-LABS Consortium

Cincinnati, OH, Columbus, OH, Birmingham, AL, Pittsburgh, PA, Bethesda, MD

Background: Careful study of the safety and efficacy of adolescent weight loss surgery (WLS) is critical to empirically inform age-salient patient care. To date, we lack an understanding of how pre-operative comorbidity burden impacts adolescent health- and weight-related quality of life (HRQOL, WROQOL). Methods: Baseline data from a prospective multicenter observational study (Teen-LABS) characterized 242 adolescents undergoing WLS (75.6% female; 71.9% White; Mage=17.1; MdnBMI = 50.5kg/m2). Standardized criterion defined the presence/absence of 14 comorbid conditions, including elevated depressive symptoms (DEP; BDI), binge eating disorder (BED;QEWP) and HRQOL (SF36) and HRQOL (IWQOL-Kids). A cumulative Comorbidity Index (CI) was computed for males (Mdn=4.3; range 1-8) and females (Mdn=3.9; range 0-9). Results: The most prevalent comorbidities were dyslipidemia (74.4%), chronic pain (59.3%), obstructive sleep apnea (56.6%), hypertension (45.0%), and PCOS/menstrual irregularities (43.2%), relative to BED (15.4%) and DEP (14%). Gender-stratified, multivariable regression revealed CI was associated with only male WROQOL. For males and females, BMI, chronic pain, and DEP, as well as BED for females, were significant predictors beyond the CI, although varied by HRQOL/WROQOL scale. Exploratory analyses suggest additional less prevalent conditions (e.g., stress urinary incontinence) also contributed to HRQOL/WROQOL impairment. Conclusions: Severe excess weight and associated comorbidities significantly impact adolescent HRQOL/WROQOL. While several indicated factors may resolve with weight loss (e.g., chronic pain, total comorbidity burden), others (e.g., DEP) may not without targeted intervention. This comprehensive characterization establishes an empirical base from which to understand HRQOL/WROQOL postoperatively, as weight and comorbidity profiles change over time.
T-234-P

This abstract has been withdrawn.

T-235-P
Trends in Weight Regain Following Gastric Bypass (RYGB) Bariatric Surgery
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Background: The purpose of this study is to assess whether percent weight regain following RYGB differs among stratified cohorts of patients based on success of weight loss in the first post-operative year. Methods: Study participants were selected from a database of patients who underwent bariatric surgery between 01/01/1999 and 06/30/2009. Participants (n=300, mean procedure age=45.6, SD=9.9) completed surveys by web, phone, or paper/mail recording self-reported pre-operative weight, current weight (i.e. weight at time of survey completion), and subsequent weights over post-op-erative years. Measured weights and confirmed procedure dates were acquired from patient medical records. Mean pre-operative weight and BMI were 140.8 kg (SD=32.1) and 49.7 (SD=9.9), respectively, and mean years since surgery was 6.9 (SD=4.9). Study subjects were mostly Caucasian (56.7%) and female (80.3%). Participants were arbitrarily stratified into four cohorts based on percentage of weight loss after the first post-operative year: <25% (n=39), 25-30% (n=51), 30-35% (n=73), and >35% (n=113). One-way ANOVA analyses were conducted to assess the effect of year one weight loss on percent weight regain. Results: Mean weight regain (%) in the <25%, 25-30%, 30-35%, and >35% cohorts was 29.1 (SD=29.1), 21.9 (SD=17.1), 20.9 (SD=16.2), and 23.8 (SD=20.1), respectively. Differences between groups were not significant (F(3,272)=1.523, p=.209). However, post-hoc tests yielded a significant difference between patients who lost <25% of their weight and patients who lost 30-35% of their weight. Conclusions: Percentage of weight lost in the first post-operative year was not significantly associated with percentage of weight regain post-operatively in our study.

T-236-P
Continued Loss in Ectopic Adipose Tissue Even After Weight Stabilization Following Bariatric Surgery
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Background: The effects of bariatric surgery induced weight loss on total adipose tissue (TAT) including sub-depots, subcutaneous (SAT), visceral (VAT), and intermuscular (IMAT) are poorly understood. Methods: Whole-body MRI assessed SAT and sub-depots before (T0), at 12 months (T12) and 24 months (T24) after surgery (81% Roux-en-Y, 19% Other) in a subset of participants of the Longitudinal Assessment of Bariatric Surgery-2 (from T0 to T12, n=208 and 3M; from T12 to T24, n=42 and 7M). Paired t-tests and GLM repeated measures examined changes in TAT, SAT, VAT, and IMAT at T12 and T24, with sex and age as covariates. Results: Changes from T0 to T12 included weight (-41.9 ± 12.1 kg; -36.1%), SAT (-33.5 ± 9.6 kg; -56.3%), VAT (-29.2 ± 8.2 kg; -55.2%), VAT (-3.3 ± 1.6 kg; -72.6%), and IMAT (-0.99 ± 0.68 kg; -48.8%), all p<0.001. In females, from T12 to T24, despite stability in weight (p=0.085), VAT (-1.9 ± 6.3 kg; -5.4%; p=0.059), and SAT (-1.2 ± 5.6 kg; -3.7%; p=0.17), VAT (-0.5 ± 0.7 kg; -30.1%; p<0.001), and IMAT (-0.2 ± 0.4 kg; -13.6%; p=0.012) declined further. In males from T12 to T24, weight increased (5.1 ± 5.2 kg; 5.6%; p=0.039), but no significant changes were found for VAT (4.0 ± 5.0 kg; 14.1%; p=0.078), SAT (3.4 ± 4.6 kg; 13.8%; p=0.099), VAT (0.4 ± 1.2 kg; 14.8%; p=0.46), and IMAT (0.3 ± 0.5 kg; -17.9%; p=0.16) although the direction of change indicated regains. Conclusions: Bariatric surgery results in dramatic loss of adipose tissue from both subcutaneous and ectopic, i.e., visceral abdominal and intermuscular depots, even after weight loss has begun to stabilize one to two years post surgery. These results indicate that favorable changes in body composition can continue to occur following bariatric surgery in the absence of further weight change.

T-237-P
Perioperative Outcome of Adolescents Undergoing Bariatric Surgery: The Teen Longitudinal Assessment of Bariatric Surgery (Teen-LABS) Study
Thomas Inge, Meg Zeller, Todd M. Jenkins, Michael Helmbrath Cincinnati, OH; Mary Brandt Houston, TX; Marc Michalsky Columbus, OH; Carroll M. Harmon Birmingham, AL; Anita P. Courcoulas Pittsburgh, PA; Mary Horlick Bethesda, MD; Ralph Buncher, Stavra Xanthakos, Lawrence Dolan, Mark Mitsnefes, Sean J. Barnett Cincinnati, OH

Background: Weight loss surgery (WLS) is being used to treat severely obese adolescents, although with very limited data regarding surgical safety for currently used, minimally-invasive procedures. To assess clinical characteristics and 30-day safety outcomes of severely obese adolescents undergoing WLS. Methods: A prospective cohort study was conducted at 5 adolescent WLS centers in the U.S. Consecutive patients aged 19 years were offered enrollment into a long-term outcome study. Preoperative anthropometrics, comorbid conditions, and complications occurring in hospital and within 30 days of discharge were examined. Re-operations and hospital readmissions were adjudicated by independent reviewers to assess relatedness to the WLS procedure. Results: Mean age of 242 participants was 17.1 ± 1.6 years and the median BMI was 50.5 kg/m². Fifty-one percent demonstrated four or more major co-morbid conditions. Laparoscopic Roux-en-Y gastric bypass, vertical sleeve gastrectomy, and adjustable gastric banding were performed in 60%, 28%, and 6% of subjects, respectively. There were no deaths during the initial hospitalization or within 30 days of surgery; major complications were seen in 12 subjects (8%). Minor complications were noted in 36 subjects (15%). All re-operations and 85% of re-admissions were related to WLS. Conclusions: In this series, adolescents with severe obesity presented with abundant comorbid conditions. We observed a favorable short-term complication profile, supporting the safety of weight-loss surgery in select adolescents. Further longitudinal study of this cohort will permit assessment of long-term outcomes for adolescents undergoing bariatric surgery.

T-238-P
Pre-Operative Weight Cycling and Post-Operative Weight Regain Following Weight Loss Surgery (WLS)
Alexis Conason, Sarah Bernstein, Allan Geliebter New York, NY

Background: While most patients initially lose weight in the first year following WLS, many have difficulty maintaining the weight loss longer-term. We investigated the predictors for long-term weight regain following WLS. Methods: Participants (N=343) were recruited from a bariatric surgery office at a major urban hospital. Participants completed the Questionnaire on Eating and Weight Patterns-Revised (QEWP-R). Weight cycling, defined as number of times participant lost and regained 20 lbs or more, was assessed using the QEWP-R. Chart data were reviewed to obtain weights and self-reported weights were used when chart data was unavailable. Participants were assessed prior to WLS and at follow-up points, up to 6 years post-surgery. The current analysis only included participants who had weight data at 18 months post-op or later (n=144). Results: Data were analyzed using independent samples t-test. Participants were divided into weight regain group (n=38) (WR) vs. non-weight regain (n=106) (NWR) based on regain of >30% of weight lost (baseline-nadir). Participants in WR group had significantly more episodes of pre-operative weight cycling (M=3.1, SD=0.1) than NWR group (M=2.6, SD=1.0). t(142)=2.33, p<.02. Conclusions: Results indicate that long-term weight regain is not uncommon following WLS. Preoperative weight cycling was associated with increased weight regain following WLS. Weight cycling is often linked to patterns of restriction and overeating. These patterns can lead to disruption of the body’s physiological hunger-satiation-fullness response that may persist after WLS and contribute to weight regain. WLS candidates with weight cycling episodes may benefit from interventions that encourage correction of the physiological hunger-satiation-fullness response, such as mindful eating.
T-239-P Food Addiction and Long Term Weight Loss Outcomes Following Bariatric Surgery
Mary DiGiorgio, Monica P. Sangal, Talia Abecassis, Nancy Restuccia, Eileen Harvey, Beth Schrope, Melissa Bagloo, Marc Bessler, New York, NY

Background: Studies have suggested that food addiction (FA) plays a role in obesity andundermines weight loss efforts. However, no studies have examined the association between FA and long term weight loss outcomes following bariatric surgery. Methods: 36 patients who were at least five years post-adjustable gastric banding or gastric bypass were contacted to complete the Yale Food Addiction Scale (YFAS). Preoperative behaviors and characteristics, and postoperative outcomes were obtained from clinical records and compared between individuals who met diagnostic criteria for FA and those who did not using t-test and chi-square. Results: 8 subjects met the diagnostic criteria for FA and 28 did not. There were no differences in age, sex, preoperative BMI, preoperative tendency to eat until uncomfortably full, eating disorders, surgical procedure, greatest percent excess weight loss (%EWL) achieved, failure to achieve ≥5%EWL, or ≥EWL at the time of YFAS administration between the FA groups. More subjects who were diagnosed with FA experienced significant weight regain (<30% of lost weight) following initial weight loss (62.5% vs 14.3%, p=.005). Subjects diagnosed with FA also reported lower confidence in weight loss success before undergoing surgery (8.2 vs 9.4 on a ten-point scale, p=.02). Preoperative report of emotional eating trended toward significance (87.5% vs 54.5%, p=0.1). Conclusions: Patients with FA may be particularly vulnerable to long term weight regain after bariatric surgery. In addition, FA may be associated with emotional eating and impact weight loss confidence in patients who are considering bariatric surgery. Tailored pre and postoperative care, including psychological counseling, is warranted in bariatric surgery patients who are diagnosed with FA. Larger, prospective studies are necessary to further elucidate the role of FA in bariatric surgery.

T-240-P Smoking and Alcohol Use in Gastric Bypass Patients
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Background: Bariatric surgery may increase the risk of substance use. The purpose of this study was prospectively assess smoking and alcohol use before and after bariatric surgery, identify characteristics associated with alcohol use and smoking, and examine substance use and weight loss. Methods: Participants (N=155, Mean=50.1±11.3 y and 45.7±7.0 kg/m²) were Roux-En-Y gastric bypass patients that completed surveys on substance use pre-operatively and post-operatively. Results: Alcohol use significantly decreased preoperatively (72.3%) to postoperatively (63.2%). As preoperative alcohol quantity rose, the odds of consuming any alcohol postoperatively increased six-fold. Higher BMI increased the odds of high alcohol consumption. Of the participants who did not use alcohol preoperatively, 23.2% used alcohol after surgery. Of those who used alcohol preoperatively, 23.2% increased the odds of alcohol use and smoking. Smoking status did not differ pre (19.4%) to post- (14.8%) surgery. Among nonsmokers before surgery, 9.6% reported smoking after surgery. Alcohol use and smoking were not associated with weight loss. Conclusions: After weight-loss surgery, alcohol use declined but smoking rates did not significantly change. Younger age patients were more likely to use alcohol and smoke postoperatively. Patients with a higher BMI or a history of substance use may be more likely to use alcohol postoperatively.

T-241-P Using the EHR to Evaluate the Collateral Impact of Bariatric Surgery
Annemarie G. Hirsch, G. Craig Wood Danville, PA; Gary D. Foster, Michelle R. Lent Philadelphia, PA; Christopher Still Danville, PA

Background: Bariatric surgery is the only effective long-term treatment for morbid and obesity. The bariatric program includes lifestyle changes that may have a collateral effect on co-habitants. Studies on this topic have produced conflicting results, showing both weight loss and weight gain in family members of surgery patients. This is the largest study to investigate the impact of bariatric surgery on the growth pattern of children living with surgery patients. Methods: Child co-habitants, aged 6 to 16 years, of Roux-en-Y gastric bypass patients were identified by matching addresses from the electronic health record. Pre-operative BMI percentile was calculated using CDC growth charts. An expected post-operative weight was calculated using the pre-operative BMI percentile and age/height measured at the post-operative measure. The post-operative expected weight was compared to the actual measured weight using Wilcoxon signed-rank test. Results: The 151 children had a mean age of 11 years and 58% (n=88) were male. When stratified by pre-operative BMI percentile, 38% (n=57) had a normal BMI percentile (≤85%), 23% (n=34) were overweight (BMI %tile of 85%-95%), and 40% (n=60) were obese (BMI %tile > 95%). Among overweight or obese children, the mean post-operative weight was 3.3 lbs. less than expected (p=0.212). Obese females aged 12-16 had a post-operative weight that was an average of 14 pounds lower than expected (n=20, p=0.0296). Post-operative weight was not significantly different than expected for children aged ≤12 or for males aged 12-16. Conclusions: Adolescent females living with surgery patients experienced a significant weight loss from pre-to-post-surgery. We found a similar weight loss trend when we combined all overweight or obese children. Future research should investigate the mechanism for this collateral benefit of bariatric surgery.
Surgeons, younger providers and those with fewer years of experience were significantly associated with WLS. Given improvements in safety and efficacy of WLS, we explored pediatric providers’ obesity treatment practices and perceptions about WLS in adolescents. Methods: Surveys were disseminated via email to pediatricians, subspecialists, and surgeons. Results: A survey was completed by 12 providers representing 5% of 196 pediatricians, 13% of 337 subspecialists, and 25% of 198 surgeons. Almost half (45%) do not routinely measure BMI. Conclusions: Surgery was very effective short-term in patients with T2DM and BMI 30-35. Baseline sRAGE may predict successful outcomes after bariatric surgery. These findings need to be confirmed with larger studies.

T-244-P Healthcare Provider Opinions Regarding Weight Loss Surgery in Adolescents Poornima Vanguri, David Lanning, Edmond P. Wickham, Aruna Ambazhagan, Melanie K. Bean Richmond, VA

Background: Weight loss surgery (WLS) is a recommended treatment for severely obese adolescents with severe obesity and comorbidities. However, previous reports found pediatric healthcare providers are resistant to refer for WLS. Given improvements in safety and efficacy of WLS, we explored pediatric providers’ obesity treatment practices and perceptions about WLS in adolescents. Methods: Surveys were disseminated via email to pediatricians, subspecialists, and surgeons. Results: A survey was completed by 12 providers representing 5% of 196 pediatricians, 13% of 337 subspecialists, and 25% of 198 surgeons. Almost half (45%) do not routinely measure BMI. Conclusions: Surgery was very effective short-term in patients with T2DM and BMI 30-35. Baseline sRAGE may predict successful outcomes after bariatric surgery. These findings need to be confirmed with larger studies.


Background: Various factors have been shown to be associated with the resolution of type II diabetes after weight loss surgery. Less is known regarding the change in insulin resistance and remission of diabetes. Methods: Surveys were disseminated via email to pediatricians, subspecialists, and surgeons. Results: A survey was completed by 12 providers representing 5% of 196 pediatricians, 13% of 337 subspecialists, and 25% of 198 surgeons. Almost half (45%) do not routinely measure BMI. Conclusions: Surgery was very effective short-term in patients with T2DM and BMI 30-35. Baseline sRAGE may predict successful outcomes after bariatric surgery. These findings need to be confirmed with larger studies.

T-246-P Anemia and Related Nutrient Deficiencies After Roux-en-Y Gastric Bypass Surgery: A Systemic Review and Meta-Analysis Chia-Wen Chang, Chia-Hsiun Chang, Yaa-Hui Dong, Lee-Ming Chuang Taipei, Taiwan

Background: Roux-en-Y Gastric Bypass (RYGB) surgery is well-known to lead to short-term weight loss and intermediate glycemic control. Its long-term impact on anemia and related nutrient deficiencies remains unclear. Methods: MEDLINE and Cochrane Library were searched to identify all English reports published before 1/15/2013. Our outcomes of interest were the change in the following measurements from the baseline, including the proportion of anemia, low plasma levels of ferritin, iron, vitamin B12, and folate. Articles were selected if case number >100, follow-up period >12 months, and presenting data both before and after surgery. Two reviewers independently applied selection criteria, performed quality assessment, and extracted data. We used fixed effect and random effect model with inverse variance weights to calculate the summary estimates of outcome of interest at 6, 12, 24, and 36 months after surgery. Results: We identified 10 retrospective and 3 prospective studies with 5,479 enrolled patients for planned comparisons. Proportion of patients with anemia significantly increased from 12.8% at baseline to 28.7% at 12 month follow-up, with a consistent decrease in hemoglobin and hematocrit level. Patients with low plasma vitamin B12 level increased from 2.8% to 4.6%, and those with low ferritin level rose from 4.4% to 8.0% at 12 month after surgery. No obvious change was found for patients with low plasma folate level. Conclusions: Roux-en-Y gastric bypass surgery is associated with an increased risk of anemia and related nutrient deficiencies. The cause of anemia could be multifactorial that may warrant regular monitoring and nutrient supplement when necessary.


Background: Bariatric surgery is currently the most effective treatment for obesity. Recent evidence suggests the complication rate may be higher in those with chronic kidney disease (CKD), than without. Methods: We report a retrospective study of all obese patients with CKD (kidney damage & under the care of a nephrologist, or eGFR <60/ml/min) undergoing laparoscopic bariatric surgery in 3 major London teaching hospitals from 2007-2012. Patient demographics, surgery type, weight loss, adverse events & mortality, were extracted from medical records during Oct 2012-Mar 2013. Results: Of 74 patients (33M, 41F), age (mean ±SD) 52 (±10) years, eGFR 48 (±19) ml/min, pre-operative BMI 44.5 (±5.7) kg/m2, 38% underwent Roux-en-Y bypass (RYGB), 57% sleeve gastrectomy (SG), & 5% adjustable gastric banding (AGB). 11% were classified as CKD stages 1-2, 59% CKD stage 3, 12% CKD stage 4/5 stage 5 non-dialysis, & 18% were on haemodialysis at the time of surgery. Across all forms of surgery, weight loss was 24.6 (±11.1) kg at 6 months and 30.9 (±13.3) kg at 12 months post-surgery. Weight loss after RYGB or SG was not significantly different, and both were greater than AGB. There were 16 adverse events (16/74, 22%), including 2 deaths (3%) related to surgical complications of SG. Reversible acute kidney injury occurred in 3/47 after RYGB/SG and 2/13 had dialysis access failure. Conclusions: Bariatric surgery in obese patients with CKD is safe and effective with less complications than RYGB. However, the risk of severe complications remains a challenge.
infection, B12/Fe deficiency & myocardial infarction were reported after SG only. A further 4 deaths occurred during the study period, including 2 related to cancer. Conclusions: While bariatric surgery is effective for weight loss in obese patients with CKD, the adverse event and mortality rates are high. Identification of risk factors for adverse events & investigation of nonsurgical alternatives remain priorities.

T-249-P
Secondary Hyperparathyroidism Following Laparoscopic Gastric Bypass and Sleeve Gastrectomy in Non-Caucasians
Amrita Persaud, Saqib Saeed, Shirinda McCoy, Titissa J. Reid, Leaque Ahmed
New York, NY
Background: Nutritional and metabolic complications after bariatric surgery are challenging. This study looks at prevalence rates of secondary hyperparathyroidism following bariatric surgery in non-Caucasian patients and the relationship between parathyroid hormone and vitamin D metabolism.

Methods: Retrospective study with levels of PTH, 25(OH)D, Calcium, Phosphate and Alkaline phos obtained pre-and post-op at 6months, 1yr, 2yrs and 3yrs. primary and tertiary hyperparathyroid and CKD a Stage 3 patients were excluded. Results: 366 patients met inclusion criteria. 92% females, 74% white Hispanics, 20% African-Americans. Mean age was 40 ± 0.6 yrs. Roux-en-Y gastric bypass was performed in 61%, sleeve gastrectomy in 39%. Pre-op mean levels were PTH (38±0.75pmg/ml), 25(OH)D Vit D (20.2±0.53mg/ml), calcium (9.31±0.02 mg/dl), phosphate (3.64±0.03 mg/ml) and alkaline phos (85.93±1.27 U/L). Post-op secondary hyperparathyroidism was observed in 11% of the cases at 6 months (n=142), no differences based on race/type of surgery, 23% at 1yr (n=154), higher in RYGB vs Sleeve, 26% vs 11%, p=0.004), 27% at 2yrs (n=71) and 35% at 3yrs (n=31). Vit D levels increased by 34% at 6months post-op, then declined at 1yr(28%), 2yrs(25%), 3yrs(22%), but were still higher than pre-op levels. PTH and Vit D were not related pre-op (p=0.116) but correlated inversely at 6months(r= -0.206, p<0.014), 1yr(r=-0.245, p=0.002) and at 2yrs(r=-0.314, p=0.008) post-op.

Conclusions: Following bariatric surgery there was an increased prevalence of secondary hyperparathyroidism over time, consistent with findings from previous studies. Parathyroid hormone and vitamin D showed an inverse relationship. Increased Vitamin D supplementation could help decrease the risk of secondary hyperparathyroidism.

T-249-P
Dietary Intake of Soft and Liquid Calories Is Associated with Weight Regain After Roux-en-Y Gastric Bypass
Nitin Kumar, Christopher C. Thompson
Boston, MA
Background: Roux-en-Y gastric bypass (RYGB) renders the stomach less capable of mechanical breakdown of solid food, decreasing the proportion of calories absorbed by the intestine. The pyloric sphincter is substituted by an always-patent gastrojejunal anastomosis. Soft and liquid calories quickly exit the pouch, resulting in rapid caloric absorption without induction of satiety. The aim of this study was to analyze the relative effects of nutritional and lifestyle factors on weight regain post-RYGB patients. Methods: 125 post-RYGB patients were seen in the bariatric clinic for follow-up. Dietary intake and eating habits for the prior 24 hours and instances of exercise during the prior seven days were surveyed. Demographic data and pre-RYGB, nadir, and current weight data were abstracted from clinic records. Multiple linear regression was performed using STATA 12. Results: 125 patients (49.3 ± 0.9 yr, 94.9/116F, BMI 48.7 ± 1.1 kg/m2) underwent RYGB with postoperative weight loss of 78.0 ± 2.3% excess weight loss (EWL) at nadir (loss of 104.1 ± 2.3 kg). Patients reached nadir at 18.1 ± 1.3 months. The visit occurred at 6.6 ± 0.4 yr after RYGB, when patients regained 25.9 ± 2.3% of lost weight to reach BMI of 35.7 ± 1.0. Regression for % weight regain from nadir was performed for potential predictors: BMI, time since RYG, instances of exercise, whether patient wakes up to eat, and dietary categories. Regression results revealed that only BMI (coefficient 0.99, 95%CI 0.56-1.5) and servings per day of soft and liquid calories (coefficient 5.6, 95% CI 2.9-8.3) were significant predictors of weight regain. Conclusions: After controlling for patient characteristics and exercise habits, intake of soft-consistency foods or liquid calories predicts weight regain after RYGB. Gastric bypass patients may benefit by limiting the intake of soft foods and liquid calories.

T-250-P
Behavioral and Psychosocial Associations of Weight Regain Following Gastric Bypass (RYGB) Bariatric Surgery
Elizabeth B. Simmons, Timothy C. Cooper, Kirsten Webb Sorensen, Alexander P. Nag, Jay Prystowsky, Eric Hungness, James L. Burns, Robert F. Kushner
Chicago, IL
Background: The purpose of this study is to explore the association of behavioral and psychosocial factors with percent weight regain among individuals who underwent RYGB surgery. Methods: Participants (n = 300; mean procedure age = 45.6, SD = 9.9) who underwent RYGB between 1999 and 2009 completed surveys of eating behaviors and psychosocial factors by web, phone, or paper/mail. Self-reported weights at the time of survey completion (i.e., current weights) and lowest post-operative weights were obtained. Pre-operative weights and procedure dates were confirmed through medical record reviews. Mean pre-operative weight and BMI were 140.8 kg (SD = 32.1) and 49.7 (SD = 9.9), respectively. The sample consisted of mostly white (56.7%) females (80.3%). At the time of the survey (M = 6.9 years post-op, SD = 2.3), participants had regained a mean of 23.7% (SD = 20.4) of weight lost (M = 55.8 kg; SD = 22.9). One-way ANOVA analyses were conducted to test effects of eating behaviors and psychosocial variables on percent weight regain. Results: Significant effects were seen for lack of control of portion sizes (F(4, 287) = 14.84, p < .001) and food urges (F(4, 286) = 9.70, p < .001). Significant effects of stress, emotional eating, procedure age, pre-op weight, or race were seen on percent weight regain. Conclusions: Percent weight regain following RYGB is associated with perceived changes in control of eating, depression and well-being.

T-251-P
This abstract has been withdrawn.

T-252-P
The Contribution of Relationship Stability and Relationship Quality to Weight Loss Outcomes among Bariatric Surgery Patients
Shannon Clark, Karen K. Saultes Ypsilanti, MI; Leslie M. Schuh, Joseph Stote, David Creel
Carson, IN
Background: After weight loss surgery (WLS), psychosocial functioning, including quality of social relationships, generally improves, but for a minority, relationship dissolution occurs. We examined how changes in relationship stability and quality from pre- to post-WLS relate to long-term weight loss outcomes. Methods: We used long-term follow-up data from 361 patients who provided complete data for the primary analysis of relationship change status and weight loss. The sample was 95.9% Caucasian, 80.1% female, averaged 7.7 years post-WLS, with a mean age of 47.7 years (range 21-72); 87.3% had a Roux-en-Y gastric bypass. Four relationship status groups were created: Never in a relationship (Never, n=66); Post-WLS relationship only (New-Rel, n=23); Pre-WLS relationship only (Lost-Rel, n=17); and Pre-Post Relationship (Maintainer, n=255). Results: Current BMI was 34.5 for Never; 40.5 for New-Rel; 37.4 for Lost-Rel; 33.4 for Maintainers (p<.05 for Maintainers vs. New-Rel). With respect to documented predictors of weight loss, weight loss did not differ by gender, but did differ by pre-WLS BMI (lower pre-BMI: greater %EWL). Analyses were repeated with pre-WLS BMI as a covariate; group differences remained significant [F (3, 355) = 3.09, p < .05], as did pre-WLS BMI [F (1, 355) = 9.12, p = .003]. Among Maintainers, relationship quality mediated weight loss outcomes: those with improved relationships post-WLS had significantly greater %EWL [F(2, 234) = 15.82, p < 0.000, p<.05 for Improved = (Stayed Same = Got Worse)]. Conclusions: Findings support the importance of assessing relationship stability and quality in pre-WLS candidates, as healthy and stable relationships may support improved long term outcomes. Interventions to improve relationships pre-and post-WLS may increase both quality of life and weight loss outcomes.
OBESITY 2013 ABSTRACT BOOK

POSTER ABSTRACTS – WEDNESDAY, NOVEMBER 13 to FRIDAY, NOVEMBER 15, 2013

T-253-P
Post-Bariatric Support Group Attendance and Long-Term Weight Loss Outcomes
Karen K. Saules IoPlianti, ML; Leslie M. Schuh, Joseph Stote, David Creel Carmel, IN

Background: Most weight loss surgery (WLS) programs offer supportive services and follow-up, but to our knowledge, their efficacy has not been systematically evaluated. One study tracked participants prospectively and found that patients who attended more follow-up visits (with the surgeon or nurse practitioner) had better weight loss outcomes (Shen et al., 2004), supporting the idea that more intensive post-WLS intervention might further optimize outcomes. Two retrospective studies found those who attended support groups had better weight loss outcomes up through 1-yr post-WLS (Elakkayar et al., 2006; Song et al., 2008). However, selection factors may impact who attends support groups, and longer-term outcomes of support group attendance are unknown. Methods: We used long-term follow-up data (mean of 7.7 yrs since WLS) from a sample of 418 post-surgical patients (86.2% Roux-en-y gastric bypass, 80.2% female; mean of 48.3 yrs old at surgery; 87.5%EWL at nadir; 66.5%EWL current) to evaluate distal outcomes as a function of support group attendance. Patients completed a survey via mail, online, or telephone that assessed a host of variables including current and lowest BMI, medical comorbidities, body satisfaction, relationship satisfaction, substance abuse, emotional problems, and pre- and post-WLS support group attendance. Results: Those who attended ANY post-WLS support groups had significantly higher pre-WLS BMI and lower %EWL at nadir. Those who attended 3 or more groups also had lower current %EWL. Support group attendance was not associated with psychosocial or medical outcomes. Conclusions: Results suggest that support group attendance may be an indicator of a need for even more intensive services to achieve optimal post-WLS weight loss outcomes.

T-254-P
Differential Effectiveness of Laparoscopically-Adjustable Gastric Banding Versus Lifestyle Modification for Modifying Plasma Lipoprotein Profiles
Heather Blackburn, Kimberly Mamula, Mary Jane Haberkorn, Amy Burke, Julianna E. Slavik, Nathaniel J. Sann, Kim R. Marley Windber, PA; Marina N. Vernalis Bethesda, MD; Darrell L. Ellsworth Windber, PA

Background: Obesity is an important cardiovascular disease (CVD) risk factor implicated in dyslipidemia and vascular dysfunction. Although LDL lowering is often a primary goal of therapy, the size and concentration of lipoproteins provide additional information on the true atherogenicity of plasma lipids. Surgical and lifestyle interventions are options for weight loss, but little is known about their effects on lipoproteins. Methods: Changes in BMI and plasma lipoproteins over 1 year were compared between 31 patients undergoing laparoscopically placed adjustable gastric banding (LAGB) and matched participants in two lifestyle change programs differing in scope and intensity. Lipoprotein profiles were determined by nuclear magnetic resonance (NMR) spectroscopy. Baseline values were compared using Wilcoxon Signed Rank tests for matched pairs; changes over time were assessed by paired t-tests. Results: Over 1 year, LAGB led to significantly lower BMI (-16%, p<0.001 vs baseline) than intensive (-8%, p<0.001) or moderate (-2%, p<0.05) lifestyle change (matched-pairs p<0.001 in both comparisons). Notably, lipoprotein responses differed between interventions. Intensive lifestyle led to clinical changes in total LDL particles (-10%, p<0.05 vs baseline and matched pairs), while LAGB resulted in a significant increase in HDL particles (+19%, p<0.001) versus intensive (+1%) or moderate (-6%, p<0.05) lifestyle change (matched-pairs p<0.001). Conclusions: LAGB surgery and lifestyle change led to weight loss and changes in lipoprotein subclasses; however, the interventions may affect CVD risk through different pathways. Lifestyle reduced the atherogenicity of LDL lipoproteins, which may inhibit inflammation and endothelial dysfunction. Gastric surgery improved the number of HDL particles and may protect against CVD through anti-inflammatory and antioxidant activities.

T-255-P
Two Year Evaluation of Effectiveness and Device Complication Outcomes in the Helping Evaluate Reduction in Obesity (HERO) Study
Vincent Luceo Louisiville, KY; Marcio Torre Goleta, CA; Daisy S. Ng-Mak, Arnold Degboe Irvine, CA; Caroline Burk Laguna Beach, CA; Quanhong Ni Irvine, CA; David Voellinger Charlotte, NC

Background: Few studies have assessed long term real-world effectiveness and device complication outcomes of the LAP-BAND AP® System adjustable gastric band (LAGB) after surgical implantation. Methods: HERO study is a 5-year (yr) registry of 1,106 severely or morbidly obese subjects from 29 centers in North America, Europe, and Australia implanted with LAGB. In the current analyses, the mean change in body mass index (BMI) and percentage excess weight loss (%EWL) at 2 yr are determined in addition to rates of device complications. Results: The mean (SD) age of subjects was 43.1 (11.4) yrs and females constituted 79.3%. Mean (SD) weight and BMI at baseline was 126.2(24.1) kg and 45.1(6.9) kg/m² respectively. At 2 yr, the mean (SD) BMI decreased by 8.4 (6.2) kg/m² and the average (SD) %EWL was 43.5 (33.3%). Four (0.4%) deaths occurred due to liver cancer, heart failure, ischemic heart disease, and sepsis from surgical complications. None were deemed related to the device. Device complications reported included pouch dilatation (2.0%), port displacement (1.6%), band slippage (1.4%), band erosion (0.5%), infection (0.4%), and port leak (0.1%). Twenty-seven (2.4%) subjects had explants and 35 (3.2%) had a surgical revision of LAGB. Most common reasons for explants included band erosion, abdominal pain, band slippage, and pouch dilatation. Conclusions: LAGB was associated with significant weight loss, with 6% of subjects with device complications and less than 3% of explants at 2 years. Future analysis will determine whether the weight changes are durable and the safety outcomes of LAGB remain similar.

T-256-P
Two Year Diabetes and Hypertension Control in the Helping Evaluate Reduction in Obesity (HERO) Study
Suni Bhoyrul La Jolla, CA; Daisy S. Ng-Mak, Arnold Degboe, Ted Okerson, Quanhong Ni Irvine, CA; Trace Curry Evendale, OH

Background: Few studies have reported the impact of weight loss using adjustable gastric banding (AGB) on type 2 diabetes (T2D) and hypertension (HTN). Methods: Out of 1,106 enrollees, 245 and 474 subjects reported having T2D and HTN respectively at baseline (BL). This analysis included subjects who provided BL and 2 yr data for HbA1c (n=95) and blood pressure (BP) (n=257). T2D control was based on the more stringent definition of HbA1c ≤ 6.5%. Controlled BP was defined as SBP <130 & DBP <80 with T2D and SBP <140 & DBP <90 without T2D. Control of comorbidities was compared between subjects with percent excess weight loss (%EWL) <30% vs. ≥30. Chi-square test was used to compare T2D/BP control between %EWL groups. McNemar test was used to evaluate change from baseline results. Results: At BL, mean (SD) age was 43.1 (11.4) yrs; females constituted 79.3%. Mean (SD) weight was 126.2(24.1) kg; 33% had HbA1c control and 44% had BP control. At year 2, HbA1c was controlled in 58% (p<0.05 vs. BL); BP was controlled in 53% (p<0.05 vs. BL). Among those with T2D at BL, 70% with %EWL ≤ 30% had HbA1c control at yr 2 vs. 44% with %EWL < 30% (p<0.05). Among those with HTN at BL, BP control was observed in 61% of subjects with %EWL ≤ 30% vs. 42% with %EWL < 30% at 2 yrs (p<0.05). Conclusions: AGB was associated with improved rates of clinically meaningful T2D and HTN control at 2 yrs. Future analysis will determine durability of these effects.

T-257-P
Two Year Quality of Life in the Helping Evaluate Reduction in Obesity (HERO) Study
David Voellinger Charlotte, NC; Daisy S. Ng-Mak, Arnold Degboe Irvine, CA; Caroline Burk Laguna Beach, CA; Quanhong Ni Irvine, CA; Sunil Bhoyrul La Jolla, CA; Adam Smith Fort Worth, TX

Background: Few studies have reported the impact of weight loss using adjustable gastric banding (AGB) on health-related quality of life (QOL) of obese patients. Methods: HERO is a 5 year (yr) registry of 1,106 AGB patients from centers in North America, Europe, and Australia. Our analysis included 585 subjects who completed the baseline (BL) and 2 yr Impact of

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For author conflict of interest information, see page S264

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Weight on Quality of Life-Lite (IWQOL-Lite) questionnaire. IWQOL was compared between subjects with % excess weight loss (%EWL) < 30 vs ≥ 30. Multivariate linear regression was used to examine %EWL groups associated with improvement in IWQOL, controlling for age, gender, region (US vs. Canada), and attendance. Results: At BL (median [SD] age was 43.1 [11.4] yrs, mean weight was 126.2 (24.1) kg, and mean IWQOL was 47 (19). Those with %EWL ≥ 30 were younger (mean 43 vs 45 years), weighed less (124 vs 131kg), more likely to be female (83% vs 75%), less likely to have diabetes (25% v 32%) and hypertension (42% v 57%) p<0.05 for these BL character- istics, and had higher IWQOL scores (48 v 45). At yr 2, mean (SD) IWQOL score was 77 (19). Among those with EWL ≥ 30%, score was 83 (16) v 64 (20) for those with EWL < 30% (p<0.05). Multivariate analysis revealed that women, US region, and EW L ≥ 30% were associated with clinically significant improve ment in IWQOL (p<0.05) at yr 2. Conclusions: AGB was associated with significantly better QOL at 2 yrs. Further analysis will evaluate the sustainability of these effects.

T-258-P
Effect of Roux-en-Y Gastric Bypass Surgery on Gut Hormones and Appetite in a Cohort of Adolescents
Theresa A. Wilson, Nitesh R. Mehta, Anne L. Adolph Houston, TX; Issa Zakri Philadelphia, PA; Mary Brandt, Nancy F. Butte, Houston, TX
Background: Surgical strategies are the most effective therapies for long-term weight loss success. The mechanism resulting in sustained weight loss is not well established, though the role of a gut-brain axis is postulated. Study specific aims are: 1) evaluate changes in fasting gut hormones and 2) examine the relationship between gut hormones and appetite, among adolescents undergoing bariatric surgery. Methods: Eleven ethnically diverse adolescents (14-18y) undergoing Roux-en-Y gastric bypass participated in a study with 24 hr visits at baseline and 1, 6, and 12 mo post-surgery. Anthropometry by standard techniques, body composition by 3-compartment model, and fasting blood samples were collected at each visit. Biochemistries were analyzed for gut hormones. Food intake was controlled and subjects completed Visual Analog Scales for hunger, satisfaction, fullness, and ability to eat more prior to eating and 1 hr post-prandially. Results: At 1 month post-surgery there were significant decreases in PYY 3-36, ghrelin active, leptin, insulin, glucose, and GLP-2 (p≤.04). At 6 and 12 mo, PYY 3-36, leptin, insulin, and glucose remained reduced (p≤.03). Significant influence on pre-meal VAS response to hunger was found for leptin and insulin (p≤.02); to fullness for ghrelin active (p=0.02); and being able to eat more for leptin and insulin (P<0.01). PYY 3-36 and GLP-2 (P≤0.05) significantly influenced post-meal VAS response to hunger and satiation. Additionally, satisfaction was significantly influenced by ghrelin active (P≤0.02). Conclusions: Following RYGB, gut hormone levels decreased. These data also demonstrate a link between gut hormones and appetite, thereby supporting the role of the gut-brain axis in long-term weight maintenance. Additional insight could be gained by obtaining post-prandial blood samples which coincide with administration of VAS.

T-259-P
Facilitators and Barriers to Laparoscopic Adjustable Gastric Banding Aftercare Attendance
Leah Brennan, Beth Miller, Lisa S. Hochberg, Irina Moroshko, Kylee Murphy, Paul E. O'Brien Melbourne, Australia
Background: Aftercare attendance is associated with greater weight loss and fewer post-surgical complications in obese adults who have undergone Laparoscopic Adjustable Gastric Banding (LAGB). Despite recognition of the importance of aftercare, and the failure of some patients to attend, little is known about the reasons for non-attendance. Methods: This study examined patient-perceived reasons for, and barriers to, aftercare attendance, as well as the perceived helpfulness of a range of attrition-reducing strategies. The Gastric Banding Aftercare Attendance Telephone Survey (GBAATS) was developed for the purpose of this study based on previous research and clinical expertise. It included 13 reasons for attendance, 101 barriers to attendance, and 14 possible attrition-reducing strategies. It was administered to 179 LAGB patients who had undergone LAGB between 2005 and 2012. Of these, 107 had attended aftercare regularly and 72 had not attended aftercare at all in the past 12 months. Results: Both attenders and non-attenders reported important reasons for aftercare attendance (e.g., band adjustments, questions answered) and experienced multiple barriers to attend ance (e.g., inconvenient location, work schedule). Non-attenders reported more barriers, and that those barriers had a greater impact on aftercare attendance. Participants reported that a number of possible attrition-reducing strategies may be acceptable and helpful (e.g., appointment reminders, pre-treatment counseling). Conclusions: Results are consistent with previous re-search examining correlates of non-attendance in weight management programs. Findings highlight the importance of assessing barriers to treatment in both attenders and non-attenders. Addressing barriers that differentiate non-attenders from attendees may be most effective in reducing aftercare attrition.

T-260-P
The Newfoundland and Labrador Bariatric Surgery Cohort Study: Weight Loss and Quality of Life After Laparoscopic Sleeve Gastroctomy
Laurie K. Twells, Deborah M. Gregory, William K. Mlodozd, Carla M. Dillon, Kendra Lester, Kimberley Manning, David Pace, Chris Smith, Darrell Boone, Raleen Murphy, Amanda Burton St. John’s, Canada
Background: In Newfoundland and Labrador (NL), Canada, one in three adults are obese. Laparoscopic sleeve gastroctomy (LSG) is the least common of bariatric surgeries. 100-150 LSG’s are offered each year at Eastern Health’s tertiary care centre. Methods: The purpose of the study is to assess health outcomes post-surgery. Data collection began in May 2011. Measures of weight and quality of life are collected on patients with a BMI ≥35kg/m2 (≥ 2 comorbid conditions) or BMI ≥40kg/m2 at 6, 12, 18 and 24 months. Results: Baseline (n=114) and 12 month data are presented. The sample was female (85.1%), average age: 44.2yrs (SD9.5). Baseline weight and BMI were 132.7kg (SD21.5) and 48.3kg/m2 (range 35.7-63.5). Patients presented with: hypertension (52.6%), T2DM (33.6%), sleep apnea (60.0%) dyslipidemia (51.8%), osteoarthritis (44.7%) Quality of life measures included: EQ-5D & Visual Analogue Scale (VAS), SF12 and Impact of Weight on Quality of Life-Lite (IWQOL-lite). Pre-surgery patients reported a VAS of 60.7(SD15.9) and SF12 physical and mental component summary scores of 33.7(SD12.8) and 44.9(SD11.0). The overall IWQOL-lite score was 43.7(SD11.9). At 12 months %EWL and %WL was 52.0%(24.7-85.2), and 25.7 % (13.8-43.1), respectively. The VAS increased to 85.84(SD11.0), SF12 physical 53.9(SD6.8) and mental component summary scores 50.6(SD8.9) were at or approaching Canadian normative scores for overall health. The overall score of the IWQOL-lite increased to 89.7(SD10.2). All changes were significant, p<.05. Conclusions: Results of the NL bariatric surgery cohort study report successful weight loss in the majority of patients undergoing LSG and significant improvements in quality of life at one year post-surgery.

T-261-P
Metabolic Surgery: Argentina’s Initial Experience
Diego G. Rodriguez, Susana B. Fuentes, Diego Rodriguez, Marcelo Rondina, Walter Gallovich Florencio Varela, Argentina
Background: Roux-en-Y gastric bypass surgery results in remission or improvement of Type 2 diabetes in morbidly obese patients through mechanisms other than weight loss and could be beneficial in less obese patients. The study aimed to evaluate the outcome of this surgical technique in the treatment of Type 2 diabetes. Methods: The outcomes of the first 10 patients are reported. At the time of surgery, patients (7 men and 3 women) had a BMI of 30-35 kg/m², HbA1c of 9.2 ± 1.3%, were being treated with 2 or 3 oral hypoglycemic agents, and 7 of them were receiving insulin treatment. All patients less than 65 years old. The procedure of choice was a Roux-en-Y gastric bypass with a biliopancreatic limb of 100cm and an alimentary limb of 150cm. Patients included in this evaluation met the following criteria: type 2 diabetes with poor control, C-peptide <1 pg/dL, HOMA-IR < 3, were negative for autoantibodies. Results: The main studied outcomes were percentage of patients withremission of diabetes (HbA1c <6.5% and fasting glucose less than 126 mg/dL without insulin therapy). 1 - Remission of diabetes was detected in 80% of the cases. 2 - The remaining 20% showed an improved glycemic control. 3 - HbA1c decreased from 9.2 ± 1.3 % to less than 6.5% in all patients. 4 - Percent weight loss postoperatively was 23.3 ± 5.9 %, 5 - Morbidity and mortality rates were 20% and 0%, respectively. Conclusions: Since November 2011, we performed metabolic surgery on diabetic patients with grade 1 obesity (BMI 30-35 kg/m²). The technique of choice was laparoscopic Roux-en-Y gastric bypass, which was effective in achieving
weight loss and improving the metabolic state of type 2 diabetic patients. Our results meet international standards.

**T-262-P**

**Effects of Obesity on Cardio-Pulmonary Function in Patients Undergoing Bariatric Surgery**

Salem Ali, Roberta M. Goldberg, Leopoldo Segal, Manish Parikh, Monvadi B. Sriuchai, Kenneth I. Berger, Ben Oppenheimer

**New York, NY**

**Background:** Obesity has been shown to be associated with vascular congestion and a high cardiac output state. DLCO is commonly normal amongst obese subjects. However, in some obese subjects, a decrease in membrane diffusion (DM) may be present, particularly in those with elevated capillary blood volume (VC); potentially indicating subclinical pulmonary edema and central circulatory congestion. **Methods:** 54 obese subjects were studied prior to undergoing bariatric surgery. Pulmonary testing included spirometry, plethysmography, DLCO with partition into VC and DM, impulse oscillometry (IOS) to assess distal respiratory function. Cardiac magnetic resonance imaging (MRI) was performed in 24 subjects. **Results:** The mean age was 45±12yr and the BMI was 45±7kg/m2 (71% female). Baseline spirometry revealed no evidence for airway obstruction. DLCO ranged from 59% to 141% predicted, DM ranged from 60% to 155% predicted, and VC ranged from 90% to 218% predicted. To evaluate the relationship between these components of DLCO, the ratio between DM and VC was calculated and two phenotypes were defined as low (<70%) and normal (≥70%). In these subjects, low DM/VC ratio was associated with significantly higher air resistance. There were significant differences in the BMI, spirometry, lung volumes, and incidence of metabolic syndrome or its components between the 2 groups. Of the 24/54 patients who had cardiac MRI performed, there were 12 with a low DM/VC ratio. These subjects had significantly lower cardiac output, stroke volume and right ventricular end diastolic volume. **Conclusions:** This study demonstrates that a distinct phenotype of obese patients can be identified who have low DM, high VC, higher airway resistance and lower cardiac output. These associations suggest a mechanism related to fluid transudation associated with central vascular congestion.

**T-263-P**

**Patients Factors Associated with Undergoing Gastric BANDING vs. Gastric Bypass for Weight Loss**

Caroline M. Apovian, Karen W. Huskey, Donald T. Hess, Benjamin E. Schneider, George L. Blackburn, Daniel B. Jones, Christina C. Wee Boston, MA

**Background:** Roux-en-Y Gastric Bypass (RYGB) and Laparoscopic Adjustable Gastric Banding (LAGB) are the two most common weight loss surgeries (WLS) procedures in the US with different profiles for risk and effectiveness. Little is known about factors that might lead patients to proceed with one procedure over another. **Methods:** We interviewed patients seeking WLS (response rate 70%) recruited from 2 academic WLS centers in Boston. We conducted multivariable analyses to identify patient perceptions and clinical and behavioral characteristics that correlated with undergoing LAGB (n=237) vs RYGB (n=298). **Results:** After adjustment for sociodemographic and relevant clinical factors, older patients (OR 1.03 (95% CI 1.00-1.05)) and those with higher quality of life (QOL) and higher levels of uncontrolled eating were more likely to undergo LAGB compared to RYGB. In contrast, those with type 2 diabetes (OR 0.44 (0.27, 0.71)), those who desired higher levels of weight loss and those who were willing to assume higher levels of mortality risk to lose weight were less likely to proceed with LAGB. After initial adjustment, men, those with lower body mass index, and those who perceived lower health threat from their weight appeared more likely to opt for LAGB; however, differences across these factors dissipated once we adjusted for patients’ perceived ideal weight, predilection to assuming risk to lose weight and eating behaviors. Patients’ motivations for weight loss, their primary source of WLS information and their perceived life-expectancy were also not significant correlates. **Conclusions:** Subjects’ diabetes status, QOL, eating behavior, their ideal weight loss and the level of mortality risk they were willing to assume to achieve their ideal weight were associated with whether patients proceeded with LAGB vs RYGB. Other demographic and clinical factors were less important.

**T-264-P**

**Endoscopic Sleeve Gastropasty as a Potential Treatment of Obesity: Six-Month Efficacy Results in Six Patients**

Barham K. Abu Dayyeh, Andres Acosta, Elizabeth Rajan, Michael Camilleri, Christopher J. Gostout Rochester, MN

**Background:** Bariatric surgery is the most effective therapy for obesity and metabolic syndrome. Prior restrictive procedures that do not reduce distal gastric reservoir function are associated with reduced efficacy in achieving weight loss. Emerging endoscopic technologies can replicate, in a minimally invasive and cost-effective manner, the anatomic alterations achieved by surgical sleeve gastrectomy (SSG). Aim: To demonstrate technical feasibility, short term safety and efficacy of endoscopic sleeve gastropasty (ESG) aimed to replicate sleeve gastrectomy for the treatment of obesity. **Methods:** In a prospective, single-center, pilot study of 6 obese subjects (5 females, mean BMI 36.3±2.2 [SD] kg/m2; age 37±9.5y), we performed ESG using endolumenal suturing (Oversitch, Apollo Endosurgery). Subjects were followed for 6 months to record adverse events and measure changes in weight, three-factor eating behaviors questionnaire R-21 (TFEQ21), and bariatric quality of life (BQL) questionnaire. Repeat upper endoscopy was performed at 3 months to assess durability of the ESG. **Results:** ESG was well tolerated by all with no intraoperative complications; post-procedure, 1 of 6 was admitted for observation, and 5 discharged from the endoscopy unit. The number of interrupted full-thickness sutures placed was 24±3. One subject developed a peri gastric inflammatory serous fluid collection treated with percutaneous drainage with complete resolution. Percentage body weight loss (BWL) was 15.3±4.7% at 6 months (p=0.002) resulting in BMI decrease from 36.2±2.2 to 30±2.8kg/m2 and percentage of excess BWL was 35.5±6.4%. Subjects reported improvement in eating behavior by TFEQ21 and BQL. Repeat upper endoscopy at 3 months (n=3) showed intact sleeve gastropasty. **Conclusions:** ESG is feasible and safe with short term efficacy similar to that reported with SSG.

**T-265-P**

**Lipid Profile Changes in the Super Obese After Laparoscopic Sleeve Gastrectomy (LSG) at 1, 3 and 5 Years**

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**Background:** Since there is an increasing acceptance of the LSG and limited information on its effect on cardiac risk factors, we assessed lipid profiles. **Methods:** A retrospective review of patient records pre and post LSG was performed. ANOVAs evaluated group differences and change. Pearson correlation coefficients (r) evaluated the relationship between continuous variables. Paired t tests compared variable changes. **Results:** Eighty two patients (67% female) had pre-surgery lipid profiles and follow-up (43 at 1 yr, 28 at 3 yr and 26 at 5 yrs). Groups were not different in gender distribution. The mean age was 46.4 (Group comparison, P=0.07). The pre surgery BMI was 55.7±12.9kg/m2. 65.9% of the subjects were super-obese. After surgery % excess BMI loss was 58.1% yr 1, 61.3% yr 3 and 39.0% yr 5, [yr 1 p=0.001 and yr 3 p=0.001 compared to yr 5]. Lipid measurements were within the normal ranges for all parameters at all times, however, at baseline approximately 35.4% had some abnormality. Compared to baseline, cholesterol increased at year 3, p=0.027. At yr 1 triglycerides decreased significantly from baseline (p=0.013). HDL was significantly different from baseline, yr 1, p=0.025 and yr 3, p=0.001. Yr 3 cholesterol/ HDL decreased, p=0.025 compared to baseline, Yr 1 compared to baseline HDL had a correlation with weight loss (P = 0.06; r= 0.32). For yr 3 the p= 0.08, r= 0.37. Negative linear correlations were present for LDL change at yr 3 ( r = 0.46, p= 0.02) and triglyceride change at yr 5 ( r=0.48, p=0.02). The percentage of patients with dyslipidemia or receiving medication did not change significantly during these 5 years. **Conclusions:** Of the population electing LSG, 35.4% showed some abnormality pre-surgery. Weight change does correlate with some changes of triglycerides, HDL, and LDL over time, but the impact is limited.
T-266-P
RYGB Revision Weight Loss and Psychological Functioning Outcomes
Melissa E. Pulcini Ypsilanti, MD; Leslie M. Schuh Carmel, IV; Karen K. Saules Ypsilanti, MD; David Creel, Joseph Stote Carmel, IN
Background: A subset of bariatric surgery patients undergo one or more revision surgeries for inadequate weight loss and/or complications. There are few direct comparisons of these patients and those who do not undergo revision surgeries. Methods: Long-term outcome questionnaires were collected from St. Vincent Bariatric Center of Excellence patients: 356 had Roux-en-Y gastric bypass (RYGB) and no subsequent surgical revisions and 36 had an initial surgery that was later revised to RYGB. Presurgical weight (defined as weight at time of revision surgery in the Revision group) was measured and current weight was obtained via self-report. Current psychological well-being and global life satisfaction were assessed using the Flourishing Scale and Satisfaction With Life Scale, respectively (Diener et al., 2010; Diener, Emmons, Larsen, & Griffin, 1985). Overall surgery satisfaction was assessed using a single 0-10 point Likert-type item. Results: Groups did not differ significantly on preoperative BMI (50.8±8.8 kg/m²), age (55.8±9.7 yrs), or time since most recent surgery (7.6±1.7 yrs). Compared to the No-Revision group, the Revision group lost a significantly lower percentage of body weight (33.4±12.5% vs. 24.4±19.1%, p=.005), had less overall satisfaction with surgery (8.2±2.3 vs. 7.0±2.8, p=.01), and trended toward reporting poorer psychological well-being (47.1±8.2 vs. 44.0±8.6, p=.06) and less global life satisfaction (24.7±7.3 vs. 22.8±7.1, p=.13). Conclusions: Although bariatric revision patients demonstrated outcomes less favorable than primary patients, they did achieve significant benefit and were relatively satisfied overall. Results suggest the importance of optimizing outcomes after primary bariatric surgery and providing realistic expectations about revision surgery outcomes.

T-267-P
Range of Nutrition-Related Adverse Events After Bariatric Surgery: Systematic Review of 156 Case Reports
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Background: Bariatric surgery has increased dramatically during the last decade but there is considerable uncertainty about safety, especially relating to long-term nutritional deficiencies. Methods: A systematic review of English articles using MEDLINE and EMBASE from 1981 to December 2012. All published case reports pertaining to bariatric surgery patients were included and summarized in order to provide comprehensive documentation of safety issues. Results: In total, there were 156 nutrition-related case reports, of which 46% concerned gastric bypass, 31% gastric banding, 7% biliopancreatic diversion, 6% vertical banded gastroplasty, 4% jejunoileal bypass and 7% other. Gastrointestinal (37%), neurological (14%), and device malfunction (13%) were the most common complications. Gastric bypass and biliopancreatic diversion accounted for 61% of case-reports related to nutritional imbalances, such as Wernicke’s syndrome, neurological neuropathy and oxaluria. Psychosocial complications included anorexia nervosa, eating disorders not otherwise specified, psychosis, pica, depression and alcohol/drug abuse. We identified 12 types of specific nutritional imbalances, such as hypoaalbumenaemia, energy-protein malnutrition, vitamin B1 and vitamin D deficiencies, with gastric bypass and biliopancreatic diversion accounting for 69%. Sixty-one percent of adverse events were judged as potentially preventable through increased follow-up and adherence to prescribed supplements and post-operative care. Conclusions: While case reports may be intrinsically biased in what they report, the available documentation nevertheless suggests that patients were diagnosed with a wide range of nutrition-related complications, many of which could potentially have been prevented with greater post-operative care and follow-up.

T-268-P
Status of High-Sensitivity C-Reactive Protein (hs-CRP) as a Biomarker for Cardiac Health in Laparoscopic Sleeve Gastrectomy Patients
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Background: Adipose tissue plays a role in development of the low-grade inflammatory state associated with obesity. Inflammation may play a key role in the formation and progression of atherosclerotic plaques, which accumulate on blood vessel walls leading to cardiovascular pathologies. C-reactive protein (CRP) is an acute phase inflammatory protein endorsed by the American Heart Association as a biomarker for the assessment of cardiovascular risk (i.e., >3mg/L-high risk) and a positive correlate with obesity. Methods: This study examined changes in circulating hs-CRP levels with respect to cardiovascular health and adiposity in a baseline cohort of patients (n=67) who have undergone laparoscopic sleeve gastrectomy for the treatment of morbid obesity. hs-CRP, fasting lipid panel, and liver function test as well as anthropometric measures were collected at baseline, 3 and 6 months.
Results: The sampling population at baseline (n=67) was 83.6% female and displayed the following characteristics in terms of mean (SD): age 44.6 (9.8), weight of 133.7kg (22.5), waist circumference (WC) 141.7cm (16.7), and BMI of 43.3kg/m² (6.7). Patients reported: hypertension (53.6%), T2DM (42%), sleep apnea (60.6%), coronary artery disease (5.8%), and dyslipidemia (57.4%). Pre-operative hs-CRP level: 13.0mg/L (10.4). At 6 months post surgery (n=48) weight, WC, BMI, and hs-CRP were 101.3kg (16.1), 112.4cm (11.6), 36.7kg/m² (5.2) and, 6.3mg/L (6.4) respectively. All changes significant at p<0.05. Conclusions: All eligible surgical patients were assigned an elevated risk category for CVD pre-surgery. Post-surgery, improvements in hs-CRP demonstrate a decreased level of risk for the development of CVD.

T-269-P
Psychosocial Predictors of 2-Year Outcomes among Weight Loss Surgery Recipients: Honing in on Factors That Matter
Sharlene Wedin, Alek Madan, Jennifer Correll, Nina M. Crowley, Robert J. Malcolm, Jeffrey J. Boreckardi, T. Karl Byrne Charleston, SC
Background: Weight loss surgery (WLS) is an effective treatment for long-term weight loss for individuals with Class III obesity. Psychosocial factors can affect short-term WLS outcomes. This study sought to identify psychosocial predictors of long-term outcomes. Methods: In this prospective study, 250 consecutive WLS candidates were evaluated between January 1, 2010 and December 31, 2010. Each completed baseline medical, surgical, and psychological evaluation as part of standard of care. Two hundred and four patients had surgery (81.6%). Successful surgical outcome was defined as ≥50% excess weight loss (%EWL) two years post-surgery; outcome data were available for 80 patients. Results: Logistic regression revealed an overall effect for a model that examined the association between baseline characteristics and 2-year outcome, X² (8) = 17.49, p < 0.0254. Pre-surgical marital status (OR = 6.67), emotional eating (OR = 6.33), functional impairment due to pain (OR = 9.73), and history of physical abuse (OR = 0.19) were independently associated with outcome, p<0.05. No other significant predictors were identified. Conclusions: Being married, perhaps as a proxy for social support, increases the odds of long-term WLS success. A willingness to acknowledge emotionally driven, disordered eating patterns also increases the odds of long-term WLS success. However, functional impairment due to pain and a history of physical abuse decrease the odds of successful long-term outcomes. Selection bias may confound findings given the limited number of patients available for 2-year follow-up. Proactively addressing longer-lasting functional impairment due to pain and consequences of historical physical abuse may improve WLS outcomes.

T-270-P
A Comparison of Sertraline Tablet and Solution Pharmacokinetics Before and After Roux-en-Y Gastric Bypass
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Background: Few data are available concerning the influence of Roux-en-Y Gastric Bypass (RYGB) on the pharmacokinetics (PKs) of medications. A substantial number of patients take antidepressant medications before and after surgery, underscoring the need for pharmacokinetic data with this class of medications. Methods: A prospective, longitudinal trial is underway to assess the PKs of sertraline preoperatively at baseline (BL) and at 3 and 12 months following RYGB. Participants receive single 100 mg doses of sertraline in the tablet (Tab) and solution (Sol) forms, separated by a wash-out period, at each study time-point (BL, 3, 12 months). Sixteen plasma samples are collected over 72 hours at each sertraline administration. An interim analysis of the data is presented here and additional data are forthcoming.
Results: A preliminary analysis of the data currently available shows a sig-
significant difference in the mean area under the curve from 0-72 hours (AUC0-72) between BL (n=29; mean=502.1 ± 212.1 ng/hr/ml) and 3 months (n=16; mean=352.2 ± 125.7 ng/hr/ml; Z=-2.9, p=0.003), and BL and 12 months (n=11; mean=306.2 ± 120.8 ng/hr/ml; Z=-2.7, p=0.006) post-surgery associated with the sertraline Tab preparation. No significant reduction was observed between BL and 3 months or BL and 12 month post-surgery Sol AUC(0-72).

Conclusions: Data collected to date suggest that sertraline Tab bioavailability is reduced at 3 months post-RYGB, whereas Sol bioavailability is not. Data collection is ongoing and analysis with a larger sample will allow us to examine potential mechanistic factors responsible for observed changes in pharmacokinetics.

T-271-P

Revisional Bariatric Surgery: Primary Surgical Procedure but Not Reason for Revision Affects Weight Outcomes
Leslie M. Schuh, Brenda Logan, Brenda M. Cacucci, David Diaz, Christopher M. Evanson, John M. Huse, Margaret M. Imman, Douglas Kaderabek Carmel, IN

Background: While bariatric surgery patients frequently experience life-changing health improvements, some require revision surgery for complications or weight regain. More information is needed to predict which patient will achieve sufficient benefit to justify potential complications from another surgery. Methods: This retrospective chart review examined bariatic revision surgeries performed at the St. Vincent Carmel Bariatric Center of Excellence January 1, 2008 to December 31, 2011. A subset of patients (N=45) completed a survey on weight, medical outcomes, and satisfaction with surgery. Results: 132 revision surgeries were performed, of which 93% were Roux-en-Y gastric bypasses (RYGB). Patients were 82% female with a mean age of 51 years. Complications occurred in 21.2% of patients, including wound infection (4.5%), leak (4.5%), and obstruction (3.0%). There were no deaths. Patients lost 38 lbs (13.2% of total body weight) from revision to last followup, on average 1 year post-surgery, and 85 lbs (28.8% of total body weight) from before primary surgery to last followup. Patients had equivalent weight loss after weight-related versus non-weight-related revisions. Patients having a revision RYGB after an adjustable gastric band or vertical gastroplasty lost significantly more weight than those having a revision RYGB after a primary RYGB. Rates of most medical comorbidities (9/12) decrease in the first year after revision surgery. Most patients were happy they had surgery (87%), moderately satisfied with surgery results (7/10), and believe their health improved (4.1/5). Conclusions: Revisional surgery was effective for most patients, although complication rates were higher than primary bariatric surgery. The type of initial procedure, but not the reason the revision was performed, affected magnitude of weight loss.

T-272-P

Judgments of Life Satisfaction among Bariatric Surgery Patients
Joseph Stote, Leslie M. Schuh, David Creel, Katharine C. Hudson Carmel, IN

Background: Bariatric surgery may dramatically improve well being. This study examined judgments of past, present and future life satisfaction in patients seeking bariatric surgery. Methods: 452 patients (95 male, 357 female) completed Temporal Satisfaction With Life Scale (TSWLS) based on the Satisfaction with Life Scale (Diener et al, 1985) before surgery. 223 patients completed the 15-item TSWLS, measuring past, current, and future life satisfaction (subscales ranged 5-35). 229 completed five items on current satisfaction with Life Scale (Diener et al, 1985) before surgery. 223 patients completing the entire scale. Both scores are slightly below average. Conclusions: This case the health impact of their weight. Bariatric patients' judgments of their future life satisfaction appear realistic. Our prior study of patients 7.6 years post-surgery found their life satisfaction at 24.6, the upper end of average age range. Judgment differences between the two pre-surgery groups on current life satisfaction is perhaps due to changes in the salience of factors affecting the judgment occasioned by prompting a focus on the future and past.

T-273-P

Safety Profile of Bariatric Surgery in the Elderly Minorities At a Community Hospital
Sanjiv F. Gray, Saqib Saeed, Tirrissa J. Reid, Amritta Persaud, Shirinda McCoy, Adelbola Osewa, Monjigh Al-Sawaf, Leaque Ahmed New York, NY

Background: With the known efficacy of bariatric surgery and its increasing application to the elderly population, we sought to assess the safety profile of bariatric surgery in elderly minorities at a community hospital. Methods: Retrospective study of bariatric patients at a New York City hospital from 2004-2012. Length of stay (LOS), peri-op complications, 30 day readmissions and mortality were compared in patients ≥ 60 years of age vs. random sampling of pts under 60 years old (y.o. Results: Baseline characteristics of ≥ 60 y.o. (43 pts) vs. < 60 y.o. (75 pts): 76.3% Hispanic, 17.8% AA, 3.4% non-Hispanic whites, 2.5% other: mean age 63.7 yrs (60-72) vs. 39.7yrs (20-57); 83.7% vs. 94.7% females; BMI 46.5 ± 10 vs. 45.9 ± 0.7 kg/m2; Excess wt 55.1 ± 2.6 vs. 55.0 ± 2.2 kg; 55.8 ± 22.1% with DM2; 90.7 ± 32% with HTN. LOS was significantly longer in a 60 vs. < 60 y.o. (3.46 ± 0.3 vs. 2.6 ± 0.1 days, p=0.03), but this diff disappears after excluding pts with DM2. (2.63 ± 0.34 vs. 2.55 ± 0.13 days, p=0.79). Complications in the immediate post-op period occurred in 4.6% pts ≥ 60 y.o. vs. 2.7% pts under 60 y.o. Readmissions within 30 days occurred in 9.3% pts ≥ 60 y.o. and in 4% pts <60 y.o. There was no mortality in either group. Conclusions: While the complication and readmission rates were higher in elderly minorities compared to non-elderly minorities, there was no difference in mortality rates. Diabetic elderly patients may have increased length of stays.

T-274-P

Effectiveness of Bariatric Surgery in Elderly Versus Non-Elderly Patients
Saqib Saeed, Sanjiv F. Gray, Tirrissa J. Reid, Amritta Persaud, Shirinda McCoy, Adelbola Osewa, Monjigh Al-Sawaf, Leaque Ahmed New York, NY

Background: This study compares the pattern of weight loss after bariatric surgery in patients ≥ 60 years old (y.o.) with patients < 60y.o. and its effect on urine albumin in both the groups. Methods: Retrospective study of bariatric patients at a NY hospital from 2004-2012. Inclusions: patients with pre-op and 1 yr. post-op values for urinary albumin creatinine ratio (UACR) and weight. Exclusions: patients with pre-op CKD a Stage 3. Data are presented as mean ± SE. Paired Student’s t-test was used for analysis. Results: Baseline characteristics of ≥ 60 y.o. (n=23): mean age 62.8 yrs. (60-68 yrs.); 80.8% Hispanic, 17.8% African American (AA); BMI 46.1 ± 1.3 kg/m2; 56% with DM2; 84% with HTN. Baseline for pts. < 60y.o. (n=73): mean age 39.7 yrs. (20-57 yrs.); 80.8% Hispanic, 17.8% AA; BMI 46.0 ± 0.7 kg/m2; 25% with DM2. 36% with HTN. At 1 year post-op, patients over and under 60 y.o. had significant weight losses, 61.2 ± 3.6% excess weight loss (EWL) and 68.1 ± 2.4% EWL respectively, with no diff in % EWL based on age. At baseline, patients > 60 y.o. had significantly higher UACR than those <60 (46.8 ± 19.5 vs. 10.3 ± 2.2 mg/g; p=0.002), and this difference persisted at 1 yr. post-op, p=0.009. At 1 yr. post-op, both groups had decreased UACR, but the difference was not statistically significant compared to baseline. Conclusions: Bariatric surgery was effective for weight loss in this group of predominantly Hispanic and AA patients, regardless of age. Baseline UACR was higher in the elderly; this may reflect longstanding diabetic and hyper-tensive nephropathy. UACR was not significantly changed at 1 yr. post-op in either age group.

T-275-P

The Association between Food Addiction, Alcohol Use and Weight Loss Surgery Outcomes at 6 Months
Stephanie Sogg, Mark Gorman, Noreen Reilly-Harrington, Caroline W. Chan, Julia P. Stern, Luke Stoeckel Boston, MA

Background: Weight loss surgery (WLS) is the most effective treatment for severe obesity. However, 20-40% of WLS patients have poor weight loss outcomes 10 years after surgery. Emerging research related to the complex interaction between substance use, “addiction-like” disordered eating, and obesity may, in part, help explain weight regain post-WLS. In the current study, we examined the relationship between these variables and weight outcomes after obesity 2013, The 31st Annual Scientific Meeting of The Obesity Society For author conflict of interest information, see page S264 S117
**T-276-P**

**Frequency of Vitamin B12, Iron and Folic Deficiencies During the First Three Years of Follow Up After Gastric Bypass**

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**Background:** Gastric bypass causes nutritional deficiencies. In Mexico the prevalence of anemia is reported to be 9.9% and it is expected that in the next years the number of subjects undergoing bariatric surgery will increase dramatically. Follow-up of these patients will be a challenge. We aimed to analyze the frequency of anemia, Vitamin B12, Iron and folate deficiencies during the first three years of follow up after gastric bypass.

**Methods:** Retrospective analysis of data from patients who underwent gastric bypass from January 2008 to December 2009, with 3 years follow up. All patients were prescribed standard multivitamin supplementation and Iron and Vitamin B12 were indicated when needed. Levels of Vitamin B12, Iron and hemoglobin were assessed, and frequencies of deficiencies during the first 6 months, second and third years of follow up were determined.

**Results:** Data of 32 patients was analyzed. 75% were women, mean BMI before surgery was 48.1 kg/m2. The highest deficiencies were found during the second year of follow up: Iron deficiency 32%, and Vitamin B12 44%; the highest frequency of anemia was found during the third year (50%). Folate deficiency was not found in any period. The frequency of anemia increased in women, from 16% in the first year, to 54% during the third year.

**Conclusions:** We found a very high frequency on Iron and Vitamin deficiency during the first three years after gastric bypass in a tertiary hospital follow up. It is very important to assess and treat individual micronutrient deficiencies in the postoperative treatment.

**T-277-P**

**The Role of the Multidisciplinary Committee in the Evaluation of Bariatric Surgery Candidates with a High-Risk Psychiatric Profile**


**Background:** Obesity is a growing pandemic. Bariatric surgery provides the only durable treatment modality for morbid obesity. Relative contraindications to surgery include serious psychiatric illnesses, such as personality disorders, psychotic symptoms, binge-eating disorder, and substance abuse. Implementation of a multidisciplinary committee (MC) integrated by medical, surgical, nutritional and psychiatric experts may help discriminate adequate candidates for bariatric surgery amongst individuals with a high-risk psychiatric profile.

**Methods:** We retrieved demographic data and other parameters of all patients seeking bariatric surgery that were evaluated by the MC from 2009 to 2010. Inclusion criteria for MC included the presence of any significant psychiatric disorder and/or substance abuse.

**Results:** A total of 136 patients (106 females, 30 males) with a mean age of 47.5 years (range, 18-85) and a mean BMI of 57.7 kg/m2 (35-98 kg/m2) were evaluated by the MC. The most frequent psychiatric diagnosis was panic disorder, followed by major depressive disorder (22%), anxiety disorders (20%), and bipolar disorder (12%). Readmission occurred in 47% of the patients, due to non-psychiatric complications. No deaths were registered. **Conclusions:** Bariatric surgery provides satisfactory results in morbidly obese patients with a high-risk psychiatric profile after the thorough intervention of a MC.

**T-279-P**

**Regression of Stage IV CKD Post Sleeve Gastrectomy in a Male with Class III Obesity and T2D**

Juliana Simonetti, Amanda Powell, Caroline M. Apovian, Andrea D. Coviello Boston, MA

**Background:** Although regression of T2D after bariatric surgery is well recognized, regression of chronic kidney disease (CKD) is not. We describe a case of improved kidney function after bariatric surgery for Class III obesity complicated by stage IV CKD.

**Methods:** A 60 yo male with Class III obesity, HTN, HL, and T2D complicated by retinopathy, neuropathy, and nephropathy was referred for weight loss to meet kidney transplant criteria (BMI <40 kg/m2). Obesity was gradual, adult onset with development of T2D. After intolerance of exenatide in addition to oral diabetic agents, A1C improved to 1.8 mg/dl (eGFR 39, CKD III), and he no longer needed kidney transplant due to BMI 44. After failing diet/lifestyle modifications, he underwent sleeve gastrectomy and was referred for improved kidney function.

**Results:** We describe a case of improved kidney function after bariatric surgery for Class III obesity complicated by stage IV CKD. Although regression of T2D after bariatric surgery is well recognized, regression of chronic kidney disease (CKD) is not. We describe a case of improved kidney function after bariatric surgery for Class III obesity complicated by stage IV CKD. Although regression of T2D after bariatric surgery is well recognized, we report the case of a male with Class III obesity and T2D who had an improvement in eGFR from 50 to 90 ml/min/1.73 m2 after sleeve gastrectomy. The patient had been on diet and lifestyle modifications, but his A1C remained high and he was referred for bariatric surgery.

**Conclusions:** Bariatric surgery can improve chronic kidney disease in patients with Class III obesity and T2D.
improvement or stabilization of kidney function. **Conclusions:** Weight loss from bariatric surgery may be associated with improved kidney function in some patients with severe CKD.

**T-280-P**

**Short-Term Changes in Fatty Acid Concentrations of Plasma Phospholipids Following Restrictive Versus Malabsorptive Bariatric Surgery**

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**Background:** Bariatric surgery (BS) promotes loss of adipose tissue, induced by decreased dietary fat intake and absorption, but the effect of BS on essential fatty acids (EFA) is unknown. We aimed to determine short-term changes in EFA following restrictive BS (sleeve gastrectomy and adjustable gastric banding [RESTRIC]) versus roux-en-y gastric bypass (RYGB), a malabsorption promoting surgery. **Methods:** Subjects were Caucasian (N=9) and African American (AA, N=11) females who underwent RYGB (N=13), or RESTRIC (N=7), and measures were obtained at baseline (before), 1, and 6 months following surgery. Measures were: fatty acid concentrations in plasma phospholipids (gas chromatography); body fat mass (air displacement plethysmography); and dietary intake (food records). To determine time and group effects, statistical tests included Chi-squared, Mann-U-Whitney, Friedmann, and Wilcoxon Signed Rank. **Results:** At baseline, the RESTRIC group had more AA and higher dietary fat intake compared to RYGB group; all other data were comparable. Following surgery, decreases in fat mass and dietary fat intake were similar in both groups. At 1 month transient changes in EFA were observed in both groups; 18:2 increased, while 16:0 and 18:1 were decreased. Decreases in 20:3o6 (-47% and -38%) and 20:5o3 (-63% and -63%) at 1 and 6 months, respectively, were found only in the RYGB group. Mead acid, a marker of EFA status improved (-70%) in RYGB but not in RESTRIC 6 months following surgery. **Conclusions:** Compared to restrictive surgery, RYGB was associated with a more altered plasma fatty acid profile during the acute 6 months following surgery.

**T-281-P**

**Timing of Glycemic Changes After Roux-en-Y Gastric Bypass in Patients with Type 2 Diabetes Mellitus**

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**Background:** Roux-en-y gastric bypass (RYGB) has shown to resolve Type 2 Diabetes Mellitus (T2DM) in severely obese patients. Our objective was to evaluate the change in T2DM parameters at discharge, 12 and 24 weeks post surgery. **Methods:** We performed a retrospective data collection from 60 patients with the diagnosis of T2DM who underwent RYGB at the Dallas Veterans Affairs Medical Center from 2003 to 2010. **Results:** Seventy five percent of patients were male with a mean age of 55±5.5 years. Initial weight was 143.4±25.0 and 6 months after RYGB it decreased to 107.3±22 kg. Fasting plasma glucose returned to normal (91.2±16.5 mg/dl) within 3 months after surgery and remained unchanged at 6 months, as did HbA1c (decreased from 6.8±1.3% to 5.9±1.4 at 3 months and 6.2±1.1% at 6 months). At discharge, 52% of patients achieved a reduction in dose and/or number of medications. Remission of T2DM was achieved by 11% of patients at discharge, 27% at 3 months and 33% at 6 months. **Conclusions:** Improvement and remission of T2DM in severely obese patients occurs within days of RYGB before significant weight loss occurs. This suggests that caloric restriction and surgery specific changes are contributing mechanisms. Diabetes improvement seems to reach a maximum at 3 months, with little to no improvement thereafter, despite continuous weight loss. This suggests the presence of a non-modifiable residual underlying abnormality, most likely a severe relative or absolute insulin deficiency.

**T-282-P**

**This abstract has been withdrawn.**
Background: Blood pressures in African populations are changing rapidly as more people move to urban areas and adopt a lifestyle resembling consumer cultures in wealthier societies. The pattern of change in cardiovascular (CVD) risk status across Africa is heterogeneous, however, reflecting variation in the process of cultural evolution, and may shed light on the paradoxically high risk of hypertension seen in persons of African origin living outside the continent. Methods: We conducted a multi-site comparative study of communities in the African diaspora, drawn from metropolitan Chicago, US; Kingston, Jamaica; rural Ghana; Cape Town, South Africa (RSA); and the Seychelles. At each site 500 participants between the ages of 25 and 44, with approximately equal gender balance, were enrolled for a longitudinal study of energy expenditure, weight and CVD risk. Blood pressure, anthropometrics, body composition were measured using standardized protocols. Results: Mean systolic blood pressure (SBP) ranged from 119-129 mmHg among men and between 110-119 among women (Ghana and RSA, respectively). In contrast to BP, BMI in men was equivalent for Ghana and RSA (mean=22) and highest in the US; mean BMI among women varied from 26-34 (Ghana and US). South African men had substantially higher blood pressures than both the Jamaicans and the Ghanaians despite similar or lower BMI and despite significant differences between BMI, men in RSA and US had similar prevalences of hypertension (28-29%). The correlation between SBP and measures of adiposity ranged from 0.15 to 0.30 in men for all sites, except RSA where it was much lower and non-significant; a similar pattern was observed for DBP. Conclusions: These data suggest there are contextual factors influencing BP and hypertension prevalence other than anthropometric risk factors in some populations of the African diaspora.

T-286-MOD
Insomnia and the Subsequent Risks of Acute Coronary Syndrome: Report from a Nationally Representative Cohort
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Background: Insomnia has been linked with obesity and cardiovascular-related diseases. While the relationships between insomnia and obesity have been widely studied, limited research has investigated the effects of insomnia on acute coronary syndrome (ACS) among general population. The objective of this study was to investigate whether the presence of insomnia is associated with the incidence of healthcare seeking for ACS longitudinally.

Methods: This study used data from the Taiwan National Health Insurance Research Database. Enrollees with ICD-9-CM diagnostic codes for insomnia (p=22,677; mean age=49 years) in service claims and without previous diagnosis of ACS or hypertension were analyzed. Drug use, sleep apnea were compared with randomly selected age- and gender-matched non-insomnia enrollees (n=68,031; mean age=49 years) in subsequent hospitalization for ACS from the recruited period (2002-2005) to 2009. Kaplan-Meier curves and the Cox proportional hazards regressions were used to calculate hazard ratios of ACS events for insomniacs and non-insomniacs.

Results: Diabetes (p<0.001), hypertension (p<0.001), hyperlipidemia (p<0.001), and depression (p<0.001) were more prevalent among insomniacs compared to the non-insomniacs (15.7/1000 vs. 8.86/1000 person-years; p<0.001). Individuals with insomnia had a 77% higher risk of developing ACS compared to those without insomnia [hazard ratio (HR)=1.77; 95% confidence incidence (CI)=1.48-2.12] after adjusting for age, gender, diabetes, social-economic status, hypertension, hyperlipidemia, and depression. Conclusions: Among individuals without sleep apnea, the presence of insomnia increased the future hospitalization of ACS. Regular and early screening for insomnia and proper treatments are crucial for the prevention of future cardiovascular risks.

T-287-P
Effect of Polymorphisms in LEP, LEPR and MC4R Genes in Binge Eating Behavior and Cardiometabolic Parameters in Obese Children and Adolescents
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Background: Single nucleotide polymorphisms (SNPs) in the leptin (LEP), leptin receptor (LEPR) and melanocortin-4 receptor (MC4R) genes may affect central energy homeostasis system increasing the risk of developing metabolic disturbances and binge eating (BE). These associations, however, remain controversial. Our aim was to investigate the effect of SNPs rs7799039 in the LEP, leptin receptor (LEPR) and melanocortin-4 receptor (MC4R) genes on obesity by comparing the effects of obesity and cardiometabolic parameters in obese children and adolescents.

Methods: 448 children and adolescents (54.0% girls; 12.5±2.7 years; Z-BMI 2.31±0.34) had anthropometric and metabolic variables assessed. BE was evaluated according to Taussig. Statistical analysis were performed using Student’s t and Mann-Whitney Tests with significance level set at p<0.05.

Results: Girls carrying the G allele of rs1137101 (A>G) presented lower BES scores (p=0.013) and higher triglyceride levels (p=0.039) in comparison with AA genotype girls. Among girls, carriers of the A allele of rs1137100 (A>G) showed lower waist-to-height ratio (p=0.007), systolic blood pressure percentile (p=0.004) and higher triglyceride levels (p=0.040). Girls carrying the A allele of rs12970134 (G>A) showed higher BES scores (p=0.012) and carriers of the polymorphic allele of rs12970134 (G>A) presented higher fat mass (kg) (p=0.031 and p=0.043, respectively). Among boys, carriers of the A allele of rs12970134 (G>A) showed lower HOMA-IR (p=0.041), insulin (p=0.046) and leptin levels (p=0.005). Boys carrying the G allele of rs1778231 (T>C) presented higher glucose levels (p=0.029) when compared to TT genotype. Conclusions: SNPs in the LEPR and MC4R genes are associated with distinct BE and cardiometabolic parameters in obese children and adolescents.
T-289-P

Body Volume, Body Fatness and Metabolic Syndrome
Eun Jung Oh, Jae Kyung Choi, Seunah Kim, Aheum Ahn, Seoul, Republic of Korea

Background: Body volume by three dimensional body scanner (3DBS) may be an alternative index for evaluating body fatness. The aim of this study was to evaluate the association of body volume with body fatness and metabolic syndrome in Korean women.

Methods: This study included 38 women who had body volume was measured using 3DBS. We measured body fatness using Dual-energy X-ray absorptiometry and computed tomography. Subjects with metabolic syndrome were defined as having three or more of the following: high blood pressure (≥130/85 mmHg), elevated fasting glucose (≥100 mg/dl), high-density lipoprotein-cholesterol (<50 mg/dl), and abdominal obesity measured by waist circumference ≥85 cm. Results: Total, trunk, lower trunc, and limbs volumes were significantly correlated with total fat mass, percentage body fat, and abdominal fat area. After adjustment for age, current smoking, at-risk drinking, and physical inactivity, the odds ratio (95% confidence interval) of metabolic syndrome with total, trunk, lower trunc, and limbs volume were 1.08 (1.01-1.16), 1.11 (1.01-1.22), 1.20 (1.01-1.43), and 1.31 (1.04-1.66), respectively.

Conclusions: Body volume by 3DBS is significantly associated with body fatness and metabolic syndrome. 3DBS may be a useful tool for detecting and monitoring body fatness and metabolic syndrome.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Population-Based Studies of Metabolic Disorders

T-290-P

Smaller Organs with High Metabolic Rate Explain Lower Resting Energy Expenditure in Indian Than in Chinese Men
Tammy Song, Ka Vita Venkataraman, Yap Seng Chong, Peter Gluckman, Yung Seng Lee, Chin Meng Khoo, Melvin K. Leow, Yin Hao, Eric Khoo, E shyong Tai, Singapore, Singapore

Background: According to the National Health Survey 2010 conducted in Singapore, obesity prevalence is disproportionately higher in the Malays and Indians as compared to the Chinese. Lower resting energy expenditure (REE) may be a contributory factor. The objective of this study was to examine differences in REE among Chinese, Malay and Indian men and, if observed, whether differences in REE can be explained by body composition and body fat distribution.

Methods: 210 men from Singapore (n= 84 Chinese, 61 Indians and 65 Malays), aged 21 to 40 years and of body mass index 18.5 to 30.0 kg/m2 were recruited in this cross-sectional study. REE was assessed by indirect calorimetry and body composition by dual energy X-ray absorptiometry. Abdominal visceral adipose tissue (VAT), subcutaneous adipose tissue (SAT) and brain volume were measured by magnetic resonance imaging. Results: Chinese (1634±17 kcal/day) had the highest REE followed by Malays (1574±18 kcal/day) and Indians (1552a19 kcal/day). Total fat-free mass (FFM), trunk FFM, limb FFM, fat mass and SAT were important predictors of REE. VAT was a predictor of REE in Malays and Indians but not in Chinese. Brain volume was associated with REE in Malays. The difference in REE between Chinese and Indians persisted after adjustment for total FFM, limb FFM, total fat mass, SAT and VAT, however was no longer significant after correction for trunk FFM and brain volume. Conclusions: Lower REE in Indian compared to Chinese men may contribute to the higher rates of obesity and difficulty in weight management observed in the Indian population. Lower REE in Indian men may be mediated by a lower metabolically active visceral organ mass (main contributor of trunk FFM) and brain volume. Public health recommendations tailored to Indians should encourage higher levels of physical activity and lower levels of energy intake.

T-291-P

National Trends in the Comorbid Health Status of Individuals Undergoing Bariatric Surgery, 1998-2010
Rebecca Speck, David Sarwer Philadelphia, PA; Tuhina Neogi Boston, MA; Dale S. Bond Providence, RI; John T. Farrar Philadelphia, PA

Background: Bariatric surgery is increasingly recognized for its impact on weight-related comorbidities. Whether the proportion of individuals presenting with more obesity-related comorbidities has increased is unclear. This study evaluated changes in the comorbidity status, including musculoskeletal disorders, among bariatric surgery cases. Methods: Nationwide Inpatient Sample data from 1998-2010 were used. Cases of obesity treated with a bariatric procedure were identified per ICD-9 codes, excluding emergent admissions. The Charlson Comorbidity Index (CCI) score was generated; re-coded as 0 vs. ≥1, given the small proportion of cases with CCI ≥2. Musculoskeletal disorders included lower body osteoarthritis (LBOA) and fibromyalgia. Trends were evaluated with Poisson regression for survey data, adjusted for sex, age, and race. Results: From 1998-2010 the comorbidity status of cases increased significantly. In 1998 37.1% of cases had a CCI=1, in 2010 51.6% did. The prevalence of diabetes, renal disease, and rheumatologic disease increased two-fold (or more). Adjusted trends increased significantly for CCI=1 (3% per year) and fibromyalgia (12% per year). Compared to men, women were 14% less likely on annual average to have a CCI=1, but 11% more likely to have LBOA and fibromyalgia (8.5-fold increased prevalence). As compared to cases of “other” race (non-White and non-Black), Whites were 9% less likely on annual average to have CCI=1; Whites and Blacks were 24% and 18% more likely to have LBOA; and Whites were 69% more likely and Blacks 23% less likely to have fibromyalgia. Conclusions: Increases in the proportion of cases with more comorbidities and musculoskeletal disorders suggest bariatric surgery is being performed in increasingly sicker patients. There may be an increasing need for greater preoperative counseling and management of these conditions.

Urinary Concentrations of Dichlorophenol Pesticides and Prevalence of Obesity among U.S. Adults with Various Demographic Characteristics
Yudan Wei Macon, GA; Iyanmin Zhu Fort Valley, GA; An Nguyen Macon, GA

Background: Accumulating evidence has suggested a possible link between exposure to environmental chemicals, the so called “obesogens”, and obesity. In this study, we assessed the potential associations between exposure to dichlorophenol pesticides and obesity in U.S. adults. Methods: Study participants aged 20-85 years were selected from the 2005-2008 National Health and Nutrition Examination Survey, and were categorized as obese and non-obese based on body mass index. Creatinine-corrected urinary concentrations of dichlorophenols were determined to assess level of exposures. Results: Significantly higher geometric means of urinary concentrations of both 2,5-dichlorophenol (2,5-DCP) and 2,4-dichlorophenol (2,4-DCP) were found in racial groups of Black, and other (including Hispanic, Asian, and multi racial), in females, and in participants with lower levels of education and family income, which could reflect biological mechanisms and social factors related to the exposures. A significantly higher geometric mean of urinary concentrations of 2,5-DCP was seen in obese adults, compared to that in non-obese adults. A dose-dependent increase in the prevalence of obesity was observed in the study participants across increasing levels of urinary 2,5-DCP (p-trend =<0.0001). Multivariate logistic regression revealed that urinary concentrations of 2,5-DCP but not 2,4-DCP, were significantly associated with obesity after adjustment for age, gender, race, education, total fat intake, and physical activity. Conclusions: Our findings suggest a potential relationship between exposure to the fungiticide parathion-dichlorobenzene, measured as urinary concentrations of 2,5-DCP, and obesity in adults. The long-term impact and relevance of this exposure to human health are yet to be understood and future research could further explore these interactions.

Serum Insulin and Insulin Resistance (IR) as Predictors of Weight and Body Fat Gain in African American and Caucasian Children: A Longitudinal Study

Background: Studies examining the influence of serum insulin and IR on children’s weight and fat gain longitudinally have reported inconsistent results. Methods: A cohort of healthy African American and Caucasian children, enriched for obesity (BMI-SDS ≥1) were recruited from 1996-2002 and followed longitudinally for up to 15y. Fasting insulin and glucose were

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measured at baseline; DEXA was performed yearly. We examined baseline insulin and IR (measured as HOMA-IR) as predictors of follow-up BMI Z score and fat mass in a mixed model longitudinal analysis with fixed effects for independent variables of interest, and child-specific random intercepts and slopes over time, accounting for baseline body composition, pubertal stage, and age, sex, race, socioeconomic status, and duration of follow-up. Results: Change in BMI was studied in 249 children; change in fat mass was examined in 178. Data from 1,335 annual visits were included. At baseline, average age was 9±2y; 61% were Caucasian, 39% were African American. 39% were obese. Mean baseline BMI-Z was 1.18±1.15. Children were followed for an average of 7.2±4.3y. After accounting for covariates, neither baseline insulin nor HOMA-IR was significantly associated with follow up BMI (p>0.05), BMI-Z score (p>0.56), fat mass (p>0.16), or fat mass percentage (p>0.28). In all models, baseline BMI (p<0.001) and fat mass (p<0.001) were strong positive predictors for change in BMI and fat mass. Conclusions: These data suggest that once demographic and anthropometric factors are taken into account, baseline insulin and IR are not important predictors for gain in BMI and fat mass in children age 6-12y. These data call into question the hypothesis that hyperinsulinemia is an important etiology for obesity in children. Baseline characteristics such as BMI and fat mass are excellent predictors of children’s body mass during adolescence.

T-295-P
Characteristics of Metabolically Healthy Obese among Patients Who Underwent Bariatric Surgery
Clare Lee, Jeannie M. Clark, Mariana Lazo Baltimore, MD
Background: Recent studies describe a unique subset of obese individuals with normal metabolic profiles despite having excess weight called “metabolically healthy but obese (MHO).” Our aim was to determine factors associated with MHO phenotype. Methods: This is a retrospective study of 710 adult patients who underwent bariatric surgery at the Johns Hopkins Center for Bariatric Surgery between 2008 and 2010. All patients underwent a clinical preoperative assessment and intraoperative wedge liver resection. For this analysis, we defined MHO by the absence of both diabetes and hypertension. We used multivariable logistic regression to examine the association between MHO and potential risk factors including age, sex, race, smoking status, BMI, presence of liver fibrosis, steatosis or nonalcoholic steatohepatitis and liver enzymes. Results: The sample was 78% female, 77% white, and 48% were less than 45 years old. A total of 28.7% of the patients had MHO. Compared to those with diabetes and/or hypertension, MHO patients were significantly more likely to be non-Hispanic White OR=0.46 (95% CI: 0.27-0.72; p=0.001), younger OR=0.32 (95% CI: 0.24-0.41; p<0.001), and female OR=0.54, (95% CI: 0.30-0.97). In addition, patients with MHO were less likely to have liver steatosis OR=0.43 (95% CI:0.18-1.0) or nonalcoholic steatohepatitis (OR=0.30, CI=0.15-0.60). Conclusions: Among bariatric surgery patients, MHO was common especially in patients who were white, younger, female and with less liver injury. Further studies are needed to understand the role of MHO as a predictor of bariatric surgery outcomes.

T-295-P
Obesity Misclassification, Sedentary Behavior and Cardiometabolic Risk among Adults in the United States: NHANES 2003-2006
Mark Peterson Ann Arbor, MI; Soham Al Sinh Galveston, TX; James McClain Bethesda, MD
Background: There is a longstanding controversy regarding the screening criteria for obesity, and cardiometabolic risk, and misclassification is prevalent. Sedentary behavior (SB) and obesity are thought to be interdependent “lifestyle” factors and many individuals are at exaggerated risk for preventable disease and early mortality. Methods: Adults between the ages of 20-85 were included from the combined 2003-2006 NHANES datasets. Body mass index, percent body fat (%BF) determined by dual energy X-ray absorptiometry (DEXA), objectively measured SB, and established markers of cardiometabolic risk were analyzed. Sensitivity, specificity, and receiver operating characteristic curves were used to evaluate the performance of BMI as a continuous variable, as well as various BMI thresholds to detect obesity defined by sex-specific %BF cutoffs. SB was assessed as a stand-alone predictor of risk, as well as adjusted for total daily activity counts. Results: Approximately 33% of the men and 46% of the women who were normal weight according to BMI were obese according to %BF. The standard BMI cutoff for obesity (BMI ≥ 30) had excellent specificity in both men and women (>97%), but very poor sensitivity (<50%). The optimal BMI cutoff to detect obesity by %BF was found to be 26 for men and 25 for women. Cardiometabolic risk was robustly associated with %BF and abdominal obesity, even after accounting for baseline body composition, pubertal stage, and age, sex, race, socioeconomic status, and duration of follow-up. Conclusions: Obesity misclassification and cardiometabolic risk are prevalent, and thus diagnostic screening for obesity should be modified to account for %BF and abdominal obesity. SB is not associated with cardiometabolic risk, when adjusting for total daily activity.

T-295-P
This abstract will be presented during the Obesity journal session on Friday, November 15.

Longitudinal Trajectories of BMI and Cardiovascular Disease Risk: The National Longitudinal Study of Adolescent Health
Samantha Attard, Amy H. Herring, Annie Green Howard, Penny Gordon-Larsen Chapel Hill, NC
Background: In adulthood, excess BMI is associated with cardiovascular disease (CVD); it is unknown whether risk differs by BMI trajectories from adolescence to adulthood. Methods: The National Longitudinal Study of Adolescent Health, a nationally representative, longitudinal adolescent cohort (mean age: 16.9y) followed into adulthood (mean age: 29.0y) (n=13,643 individuals (40,929 observations)) was examined. Separate logistic regression models for diabetes, hypertension, and inflammation were used to examine odds of risk factors at adult BMI according to varying BMI trajectories from adolescence to adulthood. Results: CVD risk factor prevalence at follow-up ranged from 5.5% (diabetes) to 26.4% (hypertension) and 31.3% (inflammation); risk differed across BMI trajectories. For example, relative to men aged 27y and BMI=23 kg/m² maintained over full study period, odds for diabetes were comparatively higher for men of the same age and BMI (27y and =30 kg/m²) with gains of =8 BMI units between ages 15-20y (OR=2.35; 95% CI, 1.51, 3.66) or in those who maintained BMI=30 kg/m² across the study period (OR=2.33; 1.92, 2.83) relative to individuals with the same gain of =8 BMI units, but between ages 20-27y (OR=1.44, 1.10, 1.87). Conclusions: Specific periods and patterns of weight gain in the transition from adolescence to adulthood might be critical for CVD preventive efforts.

T-297-P
Increased Eating Frequency Linked to Decreased Obesity and Improved Metabolic Outcomes
Benjamin T. House, Grace E. Shearrer, Samantha J. Miller Austin, TX; Michael Goran Los Angeles, CA; Jamie N. Davis Austin, TX
Background: To date, only our group has explored the relationship between eating frequency and adiposity and metabolic disease. Adults between the ages of 20-85 y with the following cross-sectional measures: height, weight, BMI, dietary intake via multiple 24-h recalls, body composition via dual-energy X-ray absorptiometry, lipids, and insulin action (insulin sensitivity, acute insulin response (AIR) and disposition index (DI), a measure of beta cell function) via a frequently sampled intravenous glucose tolerance test. Each eating occasion (EO) was defined as ≥50 calories and ≥15 minutes from any previous EO. Infrequent Eaters (IE) were classified as any subject who ate <3 EO on any dietary recall (average 2.6; n=160). Normal Eaters (NE) as subjects who ate ≥3 EO on any dietary recall (average 4.3; n=160). Results: Using analyses of covariance, NE compared to IE consumed 23% more calories per day (p<0.01), ate 40% more often, and consumed 19% less calories per EO (p<0.01). NE also showed a lower BMI (p=0.01), fasting insulin (p=0.03), and triglycerides (p=0.02), as well as an increased AIR (p=0.02) and DI (p=0.03). The following a priori covariates were included: Tanner, sex, body fat, and energy intake. Conclusions: These findings suggest that increased eating frequency is related to decreased obesity and metabolic disease risk in Hispanic youth, despite increases in energy intake. However, experimental studies are warranted to assess causality in this population.
Among minority women.

methods: Electronic medical records for patients seen between 7/2010 and 6/2011 were abstracted to determine the prevalence of CMD (dyslipidemia, heart disease, hypertension, diabetes). Staged logistic regression (referred group = white men) was used to examine the impact of race/sex on cardiobidities adjusting for key confounders including/excluding obesity (body mass index ≥ 30). results: Of 1800 participants, 77% were male, 54% black, and 25% obese. Obesity prevalence differed by race/sex: black women 49%, black men 24%, white women 24%, white men 15% (P<0.01). Compared to white men, other groups had reduced odds for dyslipidemia (odds ratio=OR 0.40 [0.20,0.69]). Black men had increased odds for hypertension (OR 1.81[1.42,2.31]), and reduced odds of dyslipidemia and heart disease. Black women had a nearly 2-fold increased odds for both diabetes (OR 1.86[1.22,2.81]) and hypertension (OR 1.91[1.42,2.51]) (all models at P<0.01). The associations of black women with diabetes and hypertension were attenuated when obesity was included in the models. Other group differences remained significant. conclusions: Disparities in obesity prevalence do not completely explain race/sex differences in dyslipidemia and heart disease among HIV+ patients. Obesity mediated the association with diabetes/hypertension for black women, who may benefit from weight reduction to decrease disease risk. The nexus of the HIV and obesity epidemics has profound ramifications for long term care and prevention of cardiometabolic disease, particularly among minority women.

T-299-PDT
Secular Changes in the BMI- Waist Circumference Relationship in Mexican and Mexican-American Women
Sandra S. Albrecht Chapel Hill, NC; Simon Barquera Cuernavaca, Mexico; Barry M. Popkin Chapel Hill, NC
Background: Mexican-origin women carry a high burden of obesity and Type II diabetes. We examined trends in body mass index (BMI) and waist circumference (WC) among Mexican women (MW) and Mexican-American women (M-AW), and whether WC for given BMI level has increased over time. Methods: Nationally representative health surveys for women aged 20-30 years from Mexico (1999 and 2012) and the U.S. (NHANES) (1999-2002 and 2007-2010) were used. Quantile regressions estimated age-adjusted changes in the BMI and WC distribution across years; linear regression tested interactions between BMI and survey year. Results: BMI and WC at all percentiles increased over time for each BMI level. For example, for a 30 year old MW, WC at the 95th centile was 99.7 cm in 1999 compared to 113.3 cm in 2012. The corresponding pattern in M-AW was 111.2 cm in 1999-2002, and 123.2 cm in 2007-2012. WC was significantly higher over time for each BMI level. For example, at age 30 and BMI=30, the WC of MW increased by 9.5 cm from 1999 to 2012. Patterns were similar, though smaller in magnitude for M-AW.

T-302-P
Are overweight and obese women more likely to receive preconception care?
Rashmi Kachhoria, Reena Oza-Frank Columbus, OH
Background: Women who are overweight or obese before they get pregnant are at increased risk for adverse maternal and infant outcomes. Incomes optimizes in outcomes could be improved through provision of preconception care. However, it is unknown if preconception overweight or obesity status results in differences in receipt of preconception care. Methods: We used data from the Pregnancy Risk Assessment Monitoring System (PRAMS) (2004-2009) to examine rates of preconception care for overweight (body mass index (BMI)=25-29.9 kg/m2) and obese (BMI≥30 kg/m2) women compared to women with normal BMI (18.5-24.9 kg/m2). Data from 13 states (FL, HI, LA, MA, ME, MI, MN, NJ, OH, TN, UT, VT, VA, WI) were used in the analysis to determine the association between prepregnancy BMI and self-reported receipt of preconception care. results: Among overweight and obese women, compared to those with normal BMI, visits for preconception care were significantly higher for overweight (79.5% and 76.1%, p<0.01) and obese (66.7% and 63.8%, p<0.01) women. Conclusion: Women who are overweight or obese are at increased risk for preconception care, but do not receive the care they need.
spects of preconception care using logistic regression adjusted for survey de-
sign. Results: Overall, 33%, normal weight, 31% overweight, and 31% of
obese women reported receipt of preconception care (n=55,682). Adjusting
for mother’s age, race, education, income, pregnancy intention, parity, mari-
al status, and infant preterm status, we found no difference in receipt of pre-
conception care among women who were overweight (odds ratio (OR) = 0.94,
95% confidence interval (CI) = 0.87, 1.01) or obese (OR = 0.97, 95% confi-
dence interval (CI) = 0.90, 1.06) before pregnancy compared with women
with a normal prepregnancy BMI. Conclusions: Prepregnancy overweight
and obese status was not associated with self-reported receipt of preconcep-
tion care. Although it is encouraging that these women are receiving similar
rates of preconception care as women with a normal prepregnancy BMI,
given the increased risks of adverse pregnancy outcomes for these women,
it is important to increase the proportion receiving appropriate preconception
care.

T-303-P
Anthropometric Differences in School Children from United States and
North India
Vanisha S. Nambrar, Rujuta Desai Vadodara, India; Rashmi Kachoria, Reena
Oza-Frank Columbus, OH
Background: While overweight and obesity prevalence in children has been
well documented in the US, there is less information available for developing
countries. With over 155 million overweight school age children worldwide,
it is important to determine which populations have excess risk. Methods:
Data from the 2009-2010 US National Health and Nutrition Examination Survey
(NHANES), a serial, cross-sectional, population based survey of the
health and nutrition status of American adults and children, and the Vadodara
School Study (VSS) in Vadodara, India, a cross-sectional study of anthropo-
metric and metabolic measurements in school aged children in the third
largest city in the state of Gujarat, were used to compare anthropometric
measurements from school children aged 8-12 years. Both surveys conduct
direct anthropometric measurements. Results: Although ages were similar
(9.9 vs. 9.8; p = 0.4; NHANES [n=1005] and VSS [n=181], respectively), the
proportion of males was significantly different (50% vs. 64%). Children from
NHANES were significantly heavier (42.1 vs. 38.8 kg; p = 0.04) and shorter
(143.5 vs. 146.1 cm; p <0.01), resulting in a higher BMI (20.0 vs. 17.9
kg/m2; p <0.01) and a greater waist circumference (69.7 vs. 66.1 cm; p =
0.01). Half of the US children were overweight or obese (23.5% and 26.4%,
respectively) while prevalence was much lower among Indian children
(19.9% and 11%, respectively) (p<0.01). Conclusions: US school-aged
children are often overweight or obese with higher waist circumference
than Indian children, indicating higher risk of future metabolic syn-
drome. However, among adults, Indians have been shown to be at a higher
risk of metabolic syndrome at a lower BMI than Western adults, thus these
children may be equally at risk. Future studies should consider clinical meas-
ures of metabolic risk.

T-304-P
Does the Association Between Prepregnancy Weight and
Breastfeeding Differ by Race/Ethnicity?
Rashmi Kachoria, Reena Oza-Frank Columbus, OH
Background: Women who are overweight or obese before they get pregnant
have been shown to be less likely to breastfeeding, likely due to increased fre-
quency of cesarean section, admission of the infant to the NICU, and compli-
cations after childbirth. However, there is limited research examining how
the association between prepregnancy weight status and breastfeeding initia-
tion differs by race/ethnicity. Methods: Ohio birth certificates from 2006 to
2011 were used to examine the rates of breastfeeding for overweight (body
mass index (BMI) <18.5 kg/m2), overweight (BMI 25-29.9 kg/m2) and
obese (BMI ≥30 kg/m2) women compared to women with normal BMI
(18.5-24.9 kg/m2). Data from 80322 singleton births to Ohio resident moth-
ers of reproductive age (16 to 44 years) were included in the analysis. Logis-
tic regression, stratified by maternal race and adjusted for maternal and infant
characteristics, was used to obtain odds ratios and 95% confidence intervals
(CI) for breastfeeding initiation. Results: Underweight (odds ratio (OR) =
0.81, 95% CI = 0.78, 0.83), overweight (OR = 0.93, 95% CI = 0.91, 0.95), and
obese (OR = 0.80, 95% CI = 0.79, 0.81) non-Black women were less likely than
White women with normal BMI to initiate breastfeeding. Among non-Black Hispanics, only overweight women were less likely to
breastfeed (OR = 0.89, 95% CI = 0.82, 0.97). Obese Hispanic women (OR =
0.84, 95% CI = 0.77, 0.91) were less likely than normal weight Hispanic
women to breastfeed. Conclusions: In Ohio, prepregnancy overweight and
obesity were strong predictors of not initiating breastfeeding among non-His-
panic White women, but not among minority women, indicating there are
significant differences in the association between prepregnancy BMI and
breastfeeding initiation by race/ethnicity. Tailored education efforts are
needed.

T-305-P
Obesity and Its Association with the Incidence of Gallstone
Pancreatitis in Children
Mona Essa, Erika Pruss, Ashish N. DehRoy Houston, TX
Background: The recent increase in incidence of acute gallstone pancreatitis
in adults is attributed to the concurrent increase of the prevalence of obesity.
In children, similar observations have not been adequately studied. We exam-
ined the incidence of gallstone pancreatitis at a single center over the past 10
years and its association with obesity in children 1-18 years. Methods: Ret-
spective chart review of all children with acute pancreatitis admitted to a
tertiary care hospital from 2002 to 2012. The diagnosis of pancreatitis was
based on the presence of 2 or more of the following criteria: acute
abdominal pain, elevated serum amylase and/or lipase, and radiologic evidence
of pancreatitis. Gallstone pancreatitis was diagnosed if there was radiologic
evidence of gallstones Results: One hundred fifty seven cases with acute
pancreatitis were identified. The incidence of acute pancreatitis increased from
5/10,000 admissions in 2002 to 40/10,000 admissions in 2012. The prevalence of obesity was 36.4% (BMI > 95th % based on CDC age-
gender specific BMI chart). Forty percent of patients had gallstone pancreatitis.
Among all cases of pancreatitis, the percentage of gallstone pancreatitis
increased from 15% in 2002-2003 to greater than 50% in 2011-2012. The prevalence of obesity in patients with gallstone pancreatitis was 53%.
The majority of the patients were females and Hispanics. Using logistic regres-
sion analysis, there was a significant independent association between obe-
sity and gallstone pancreatitis (Exp (B)=8.56, P=0.03). Conclusions: The
incidence of gallstone pancreatitis in children admitted to our hospital has in-
creased during the last decade. Obesity significantly associated with this
trend. These results may explain, in part, the recent increased incidence of
acute pancreatitis in children.

T-306-P
Obesity Is Significantly Associated with Cardiometabolic Disease
Risk Factors in Multiethnic 2-to-9 Year Olds
Sarah E. Messiha, Shilpa Gurnurkar, Reem Alhezayen, Denise C. Vidot,
Ruby Natale, Kristopher L. Arheart Miami, FL
Background: One in four US children under age 5 are either
overweight/obese with ethnic-minority children being disproportionately af-
ected. Excess weight gain in the first years of life can alter developing
neural, metabolic and behavioral systems in ways that increase the risk for
chronic disease later in life. The objective of this analysis was to estimate the
prevalence of cardiometabolic disease risk factors in an ethnically diverse
sample of 2-to-9 year olds. Methods: A retrospective medical chart review
identified overweight/obese 2-to-9 year olds (N=150) from one local aca-
demic medical practice. These children were compared to an age-, sex-, and
ethnicity-matched normal weight group from the 2005-2010 National Health
and Nutrition Examination Surveys (NHANES) on systolic (SBP) and dias-
tolic (DBP) blood pressure, total cholesterol and high density lipoprotein
(HDL) cholesterol via tests and chi square analysis. Results: The local
overweight/obese sample (64% Hispanic, 74% female) had a high prevalence
of cardiometabolic disease risk factors: elevated mean body mass index per-
centile (99th), diastolic prehypertension (71%), systolic prehypertension
(40%), hypercholesterolemia (17%), and family history of type 2 diabetes
(76%). They were significantly more likely to have elevated mean SBP (111
mm Hg versus 100 mm Hg, p<0.001), DBP (68 mm Hg versus 55 mm Hg,
p<0.001), and lower mean HDL cholesterol (48 mg/dl versus 55 mg/dl,
p<0.001) versus the normal weight NHANES comparison group.
Conclusions: Our results show that even at this young age, excess weight is
significantly associated with cardiometabolic disease risk factors. Over-
weight/obese children in this age group should be followed closely to assess
potential future chronic disease risk.
T-307-P
Weight Status and Albumin-Creatinine Ratio in a Nationally Representative Sample of Children and Adolescents
Ashley C. Skinner, Maria E. Ferris, Eliana M. Perrin
Chapel Hill, NC

Background: Population based studies in adults and previous small studies in children suggest a relationship between kidney function and weight status. Our objective was to compare measures of urinary albumin and creatinine ratios across a U.S. pediatric population, based on weight status. Methods: We used the National Health and Nutrition Examination Survey (NHANES) from 1999-2010 to compare random spot albumin-creatinine ratio (ACR), defined as abnormal when ≥30 mcg/mg, for children, adolescents, and young adults ages 2-21 years by weight. Because albumin is produced by the liver, we also examined serum ALT and AST. Measured height and weight were used to determine age- and sex-specific BMI percentiles, with weight categories defined using standard recommendations. We used adjusted Wald tests to compare means and prevalence of abnormal values by weight. Results: There were 17,732 participants included with 64% healthy weight, 15% overweight, 13% obese and 5% severely obese. As severity of overweight increases, ACR decreases, and the prevalence of abnormal ACR decreases (28% in healthy weight vs. 12% in severely obese, p<0.001). Liver function was significantly worse with obesity, with AST and ALT higher and more likely to be elevated (1-2% for healthy weight vs. 8-9% for severely obese, p<0.001). Conclusions: In a nationally representative cross-sectional sample of children and adolescents, urine albumin to creatinine ratios are significantly better for overweight compared to healthy weight. This unexpected finding, compared to previous adult reports, deserves further consideration. Further exploration is needed to determine if the observed decreases in liver function are related to measurement of kidney function in overweight participants.

T-308-PDT
Triglyceride to HDL Ratios in Children: A Tool to Assess Risk of Developing Type 2 Diabetes?
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Background: Identifying potential markers for type 2 diabetes mellitus (T2DM) risk, particularly early in the lifespan, is paramount when developing preventive health strategies. C-peptide is the best measure of insulin secretion; however, the plasma triacylglycerol (TAG) to HDL cholesterol ratio may be a lower cost, less invasive, and more widely available proxy for c-peptide measures. This study evaluated the extent to which TAG/HDL ratios may serve as a predictor of insulin secretion in a pediatric population. Methods: Measures of plasma TAG, HDL cholesterol, and c-peptide response (basal (PHIB), first (PH1) and second phase (PH2) response to glucose, and c-peptide amount released immediately post glucose administration (X0)) were obtained from 205 non-diabetic multiethnic children aged 7-12 (European-American: EA, African-American: AA, and Hispanic-American: HA). Multiple regression analyses were performed to evaluate the relationships between c-peptide response and triglycerides, HDL, and TAG/HDL ratios. Models were controlled for standard covariates. Results: In HA children, PHIB1 and PHIB were positively associated with TAG/HDL ratios and negatively associated with HDL (p<0.05). Also, PHIB was positively associated with TAG in both HA (p<0.01) and EA (p<0.05) children. No significant associations were observed in AA children. Conclusions: These results indicate that c-peptide response is correlated with TAG levels in HA and EA children and with both HDL and TAG/HDL ratios in HA children; however, no such associations are observed in AA at early stages of life. These relationships add to our understanding of health disparities observed in T2DM, and show that the usefulness of TAG and TAG/HDL ratios as a proxy for c-peptide response may vary by ethnicity, thus reiterating the need for ethnicity-specific guidelines in diabetes testing and prevention.

T-309-P
Food insecurity and Insulin Resistance in Adolescents from NHANES (2003-2008)
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Background: Among adults, there is mounting evidence suggesting the negative impact of food insecurity on diet-sensitive chronic diseases such as diabetes. Thus far, metabolic consequences of food insecurity have not been investigated in children. Insulin resistance is an important mediator of metabolic consequences of obesity, and can be estimated using fasting glucose and insulin with a calculated HOMA-IR. Methods: We examined adolescents (N=1,201) aged 12-19 who were part of the fasting subsample in three cycles of continuous NHANES (2003-2008), limited our analysis to subjects with household income ≥200% FPL. Sample weights were used to account for complex, multistage, probability sampling design. Univariate linear regression was used, followed by multivariate regression in a model including BMI, race/ethnicity, age, and SNAP participation. Results: In univariate linear regression, food insecurity (combined with marginal food security) was associated with HOMA-IR (coeff 0.41, p<0.04). Weighted mean HOMA-IR increased at successive levels of food insecurity for normal weight, overweight, and obese adolescents alike. For obese adolescents, HOMA-IR was 4.8, 6.4, and 8.0, respectively, for food secure, marginally food-secure, and food-insecure subjects. Among obese adolescents, HOMA-IR was significantly associated with marginal food security in the multivariate model (coeff 2.69, p<0.01). The association with food insecurity (moderate and severe) was comparable but not significant in the multivariate model (coeff 2.65, p=0.16). Conclusions: In adolescents, the experience of marginal food security may lead to a disproportionate degree of insulin resistance, conferring a higher degree of cardiometabolic risk beyond what is seen with obesity alone. Further research is needed to clarify the contributing factors.

T-311-PDT
Plasma Vitamin D and Adiposity in Five Cohorts of African Origin: Vitamin D Ancillary Study (VIDA) Approach
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Switzerland; Terrence Forrester
Kingston, Jamaica; Estelle Lambert Cape Town, South Africa; Jacob Plange-Rhume
Kumasi, Ghana; Lara R. Dugas
Maywood, IL; John F. Aloia
New York, NY; Pauline Cunacho,
David A. Shoham, Richard S. Cooper, Amy Luke
Maywood, IL

Background: Atopic taneous measures of obesity are used as indicators of diabetes risk, the relationship between blood glucose levels and weight status is not always linear, and is modified by age. Methods: Using a sub-sample of 2009-2010 National Health and Nutrition Examination Survey data for participants (n=2031) aged 20 or older, we sought to investigate the relationship between blood glucose levels (valid 2-hr oral glucose tolerance tests) and body mass index (BMI), as well as waist circumference (WC). A Multivariate Adaptive Regression Spline approach was used to select a model to establish the BMI and WC cutoff points associated with increased blood glucose levels while accounting for age. Results: A 1-cm increase in WC above 101 cm increases risk for pre-diabetes and undiagnosed diabetes by 1.05 times, and after age 32 the risk of pre-diabetes increases by 1.07 each year. If an individual’s age is greater than 32 and WC is greater than 136, a unit increase in BMI would increase the risk of pre-diabetes and diabetes by 1.33 times. After adjusting for age and BMI and allowing for interaction between covariates, blood glucose levels linearly increased by 0.80 mg/dL with WC until WC reaches 133 cm where it levels off. Moreover, blood glucose levels increased by 0.72 mg/dL until age 74, and increased by 2.8 mg/dL afterwards. Conclusions: Waist circumference above 101 cm at age 32 and above should serve as a tipping point for screening individuals for pre-diabetes and undiagnosed diabetes.
25(OH)D2 and 25(OH)D3. **Results:** Mean total 25(OH)D levels (ng/mL) differed by latitude: US:17.2, RSA:23.7, Jam:28.9, Sey:29.2, Gihn:30.4; mean BMI was lowest in Gihn (23.9) and highest in US (31.9). Among men body fat varied from 19% (Gihn) to 33% (US) and among women from 35% (Gihn) to 46% (US). In multiple regression models adjusting for sex, country and country-by-total 25(OH)D interactions, there were signficant associations between total 25(OH)D and all parameters of adiposity: BMI, % fat, fat mass, waist and hip circumferences (all p<0.001). **Conclusions:** 25(OH)D is independently associated with obesity in African-origin populations with very divergent degrees of sun exposure, as well as plasma 25(OH)D concentrations.

**T-314-P**

The Association between Obesity and Health-Related Quality of Life among Urban Latinos

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**Background:** Previous studies have demonstrated that obesity is negatively associated with health-related quality of life (HRQL). This literature is limited by small numbers of Latinos and self-reported obesity status. In this cross-sectional study of 202 foreign-born Latinos, we examined differences in HRQL by obesity status in an urban Latino population using the Medical Outcomes Study Short-Form Health Survey (SF-12) and measured anthropomorphic characteristics. We also explored gender as a potential moderator of the relationship between HRQL and obesity status in this cohort. **Methods:** The main outcome measure was health-related quality of life (HRQL) by the Medical Outcomes Study Short-Form Health Survey (SF-12). Including the entire study cohort, t-tests were used to determine the difference between obese and non-obese participants on SF-12 physical and mental functioning scores (PCS and MCS, respectively). The association between obesity status and HRQL summary scores were then assessed separately in men and women. **Results:** There was a small but statistically significant difference between obese and non-obese participants in the physical functioning domain of HRQL (46.1 vs 46.3, P = .02), and no difference in mental functioning scores (44.7 vs 44.3, P = .22). Gender did not moderate the relationship between obesity status and HRQL scores in stratified analyses. **Conclusions:** These results in an under-studied population suggest that obesity may be associated with small decrements in HRQL among urban Latinos. Future studies with larger and more diverse Latino populations are needed to further investigate the relationship between obesity and HRQL, and explore how acculturation impacts the association between these two factors.

**T-315-P**

Diagnostc Assignment of Obesity, Metabolic Syndrome and Pre-Diabetes: Analysis of Provider Behavior

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**Background:** Appropriate management of any condition requires correct diagnostic assignment by provider. Studies have shown that early recognition of obesity, metabolic syndrome, and pre-diabetes results in improved health outcomes. We aimed to retrospectively evaluate effective documentation for diagnoses of obesity, metabolic syndrome (MS), and pre-diabetes (PDM) by non-bariatric medicine providers. **Methods:** Chart review was conducted for all consecutive patients referred to an outpatient medical weight loss clinic in 2001-2012. ICD-9 codes for obesity, MS, and PDM were utilized for data extraction at initial visit; compared with updated documentation after evaluation by a bariatric medicine physician. The AHA criterion for metabolic syndrome and the ADA criterion for PDM using Oral glucose tolerance test (OGTT) were used for all new diagnosis. Patient demographics, BMI, weight, fast mass, fat free mass, and lab data were also collected. All continuous variables were compared using T-tests and categorical variables using Chi-square. **Results:** A total of 1202 patients with BMI>30 were included in the study. Mean (±SD) age was 54.5(±13.0) years, 68.2% females, and 92.5% Caucasian. Mean baseline weight was 250.0(±43.3)lbs, BMI 40.5(±7.5), fat mass 113.6(±34.2)lbs, fasting glucose 102.0(±13.0)mg/dL, LDL 49.5(±12.7)mg/dL, and triglycerides 115.0(±133.4)mml/L. At the time of initial visit, only 40.6% were documented with diagnosis of obesity, 19.8% with metabolic syndrome, and 8.5% with pre-diabetes (p<0.001 for all comparisons). **Conclusions:** Despite obvious patient obesity, proper diagnostic documentation is not commonly practiced amongst non-bariatric medicine physicians. Such provider behavior may delay or prevent effective intervention, and could contribute to the current obesity crisis.
Obesity History Affects Health Profile and Physical Capacity of Postmenopausal Obese Women

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**Background:** Obesity-related conditions might not be the same between postmenopausal women obese for a long time period compared to newly obese older women. **Methods:** Thirty-seven postmenopausal obese women were recruited for this study. Obesity history was determined by a self-reported BMI ≥ 30 kg/m2 at age of 45. In a single visit, fasting blood sample, resting metabolic rate, anthropometric measures, blood pressure, physical capacity tests, and body composition were collected. Finally, participants were asked to wear a pedometer for seven consecutive days and mail the equipment along with a list of their current medications used. **Results:** Obese women after the age of 45 were lighter compared to women obese before age 45 (P<.01). Even when adjusted for body mass, the two groups presented a difference for waist circumference, hip circumference, and fat mass (all P<.05) with an advantage for women obese after age 45. In regards to the metabolic profile, this latter group also presented a lower fasting blood glucose compared to women obese before 45 years (P=.04). The ability to maintain balance was different between the two groups of women with a lower value in women who were obese for a longer period (3.5 vs. 12.7 seconds; P<.01). **Conclusions:** Obesity history has different health impacts and physical capacity in postmenopausal obese women. Therefore, lifestyle intervention aiming to prevent obesity related comorbidities might need to be personalized based on obesity history.

**T-317-P**

Diagnostic Definitions of Impaired Fasting Glucose in Obese Individuals with Non Alcoholic Fatty Liver Disease

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**Background:** The prevalence of Non Alcoholic Fatty Liver Disease (NAFLD) in general population is up to 20% and is higher (70-80%) in obese individuals or those with Diabetes Mellitus (DM). NAFLD comprised of benign form Fatty Liver (FL) and progressive form Non Alcoholic Steatohepatitis (NASH). NASH is associated with Insulin Resistance (IR) and pre-diabetes. American Diabetes Association (ADA) recommends a lower cut-off for the diagnosis of Impaired Fasting Glucose (IFG) than the World Health Organization (WHO) to diagnose this form of pre-diabetes earlier. This study evaluates the impact of lowering the diagnostic threshold for IFG from 110 to 100mg/dl on the prevalence of the stages of NAFLD in obese individuals without diabetes. **Methods:** From the clinical database of 445 obese individuals who underwent gastric bypass surgery and intraoperative liver biopsy, we identified 217 individuals with no prior history of DM and who were identified as non-diabetic by Oral Glucose Tolerance Testing (OGTT). Histological diagnosis of FL, NASH and fibrosis stage was correlated with IFG diagnosis with ADA and WHO criteria recommendations. **Results:** The prevalence of NAFLD was 69.9% in this non-diabetic obese population and none had cirrhosis on the biopsy. The mean age and BMI was 39 years and 30 kg/m2 respectively. The prevalence of IFG increased from 11.5% to 45.2% by lowering the cut-off from 110 to 100 mg/dl. IFG diagnosis was made in 3 times more in cases of NASH group with ADA criteria. **Conclusions:** NAFLD is highly prevalent in obese individuals who do not have overt DM. Presence of pre-diabetes in NASH predicts poor outcomes and progression of liver disease. Using ADA criterion with more sensitive cut-off to identify IFG/pre-diabetes in obese individuals with NAFLD will lead to early intervention.

**T-318-P**

Prevalence of Distinct Combinations of Co-Morbid Diagnostic Conditions for Metabolic Syndrome in U.S. Adults

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**Background:** Limited data are available on the prevalence of unique combinations of the component disorders of metabolic syndrome among adults. **Methods:** A complex, multistage, stratified geographic area design for collecting representative samples from the non-institutionalized US population. 11,652 US men and women ages 20 + years, of Mexican-American, non-Hispanic White, or non-Hispanic Black ethnicity in 1999-2010 NHANES data. Per the 2001 National Cholesterol Education Program, metabolic syndrome was defined as having 3 or more disorders in the following measurements: waist circumference, blood pressure, fasting triglycerides, high-density lipoprotein serum cholesterol, and fasting glucose. **Results:** 26.3% of adults had metabolic syndrome, which was most common among Mexican-American women; 77.5% had at least 1 disorder, and 50.3% had at least 2. Large waist circumference was the most prevalent single component disorder, and more women had large waist. The most common unique combination among those with metabolic syndrome was the disordered quartet of large waist circumference with elevated triglycerides, low high-density lipoprotein concentration, and elevated glucose. **Conclusions:** Large waist circumference is the most common single risk factor for all adults, irrespective of race, sex, or metabolic syndrome classification. The 2 most common distinct combinations of disorders for both men and women with metabolic syndrome involve waist circumference as one component. Our findings are consistent with the hypothesis that excess visceral fat may play a pathogenic role in the development of metabolic syndrome.

**T-319-P**

Comparison of WC and WHTR Measures as Indices of Central Adiposity in Guatemalan Children with the Double Burden

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**Background:** Epidemiological research has shown that the combination of impaired linear growth and obesity may lead to greater cardiovascular disease (CVD) risk. We evaluated waist-to-height ratio (WHR) compared with waist circumference (WC) in measuring central adiposity as indices of CVD risk in a population of Guatemalan children, where the double burden of overweight and stunting is prevalent. **Methods:** Twenty-one lean-non-stunted (L-NS), 36 lean-stunted (L-S), 35 overweight-non-stunted (O-NS), and 26 overweight-stunted (O-S) children 9 ± 4 years old from poor Guatemalan urban areas were recruited. Waist circumference (WC), waist-to-height ratio (WHR) and percent body fat (%BF) (using air displacement plethysmography) were measured. ANOVA one-way analysis of variance was used to compare means across the four groups. Bonferroni Tests of pair-wise comparisons were performed to identify specific group differences (statistical significance: p<.05). Pearson correlation coefficients were calculated for WC vs %BF and WHR vs %BF, comparing S and NS children and stratified by sex. **Results:** Overweight, stunted children (O-S) had significantly lower mean WC than O-NS (70.5 ± 6.2 vs 77.2 ± 9.7; p = 0.012). However, the WHR comparison revealed that O-S children had the same level of increased CVD risk as O-NS children (0.64 ± 0.04; p=0.05). We found a strong correlation between %BF and WHR vs WC for all males (0.61 vs 0.53), S males (0.63 vs 0.46), NS females (0.54 vs 0.44), and S females (0.48 vs 0.46). **Conclusions:** WC alone may underestimate CVD risk in stunted children. Where resources are scarce or %BF measurement is not feasible, using a combination of WC and WHR to indirectly measure central adiposity may be more accurate than WC alone, particularly in populations where stunting is prevalent.

**T-320-P**

Awareness, Knowledge and Perception of Concepts Related to Metabolic Syndrome and Cardiovascular Risk Factors among University Students

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**Background:** The prevalence of metabolic syndrome is on the rise, especially among young adults, and its onset may be early in life. Thus, the main objective of this study is to assess students’ awareness, knowledge, and perception of concepts related to metabolic syndrome and examines gender differences. **Methods:** A sample of 243 students (72% females and 28% males), with a mean age of 20.6 years, was selected randomly from University campus during spring 2012. Students filled out a self-reported questionnaire that included 87 questions related to concepts relevant to metabolic syndrome. Questions were divided into seven domains: diabetes, adiposity, hypertension, high blood cholesterol, arteriosclerosis, stroke, and heart infection. Anthropometric measurements including height, weight, waist circumference, percentage body fat, and visceral fat score were measured. Fisher’s Exact Test was used to test the differences in students’ responses. A P-value <0.05 was considered a statistically significant difference. **Results:**
Results indicated that the majority of students have “satisfactory” knowledge on concepts related to metabolic syndrome with few gender differences. More than 80% of students identified correctly symptoms and complications of diabetes, hypertension, arteriosclerosis, heart infarction and stroke. Thirty seven percent of male students falsely believed that diabetics may only eat special sweets compared to 22% of females (p<0.01). Adiposity was identified by 92% of students as a risk factor for heart disease. However, more than half of the students falsely identified liposuction as a state-of-the-art treatment in adiposity therapy. **Conclusions:** Overall, students showed a good understanding of illness related to metabolic syndrome with few false beliefs.

**T-321-P**

**Race and Gender Disparities in Body Composition**

**Methodologies in Relation to Inflammatory Biomarkers in Pre-Pubertal Youth**
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**Background:** Body mass index (BMI), a measure of weight status utilized in clinical settings, does not reflect maturation stage. Unlike Magnetic Resonance Imaging (MRI), a more sensitive measure, BMI cannot discern visceral adipose tissue (VAT) from muscle and bone mass. **Methods:** We examined BMI for gender-age-z-score (BMI z-score) and VAT were correlated with an obesity-associated inflammatory biomarker, IL-8, in healthy pre-pubertal (Tanner <2) black (n=11, M=6, F=5) and white (n=27, M=10, F=17) girls and boys (age 7-9 years). BMI z-score was calculated for Centers for Disease Control (CDC) 2000 growth charts; VAT was measured by MRI. IL-8 levels were measured in serum by Milliplex. Spearman’s rho race- and gender- partial correlations were employed. **Results:** Results showed a significant inverse correlation between z_BMI and IL-8 for all subjects (r=-0.38; p=0.02; p=0.05), while VAT and IL-8 were not significantly correlated (n=31; r=-0.26; p=0.17). After adjusting for race (r=-0.31; p=0.066), for race and gender (r=-0.25; p=0.14), or for gender alone (r=-0.25; p=0.13) relationships between z_BMI and IL-8 became non-significant; relationships between VAT and IL-8 remained non-significant. **Conclusions:** Utilizing MRI to directly measure VAT in pre-pubertal youth elucidated non-significant relationships with IL-8 that z_BMI (an estimate) was unable to detect, including considering gender and race. Precise measures of VAT are crucial in determining central adiposity and its relation to inflammation in developing youth. Accurate examination of the role of inflammation to the development of obesity in racially diverse youth may not be possible if sensitive measures, such as MRI, are not employed.

**T-322-P**

**Inflammation Is Not a Driver of Abnormal Metabolic Parameters in Pre-Pubertal Youth**

Jovanny Zabaleta, Cruz Velasco-Gonzalez, Nicole Pelligrino, John Estrada, Maura Mohler, Richard Scribner, Tung Sung Tseng, Amanda Arguello *New Orleans, LA*; Eric Ravussin Laramie, WY; Enette Larson-Meyer New Orleans, LA; Yolanda Powell-Young, Melinda Sothien New Orleans, LA

**Background:** Obesity is a major health problem in the United States. Obesity is considered an inflammatory disease with direct correlation between inflammation early in life. We wanted to examine for the first time the associations between V FAT [MRI]; total body (DXA), ectopic, intrahepatic (IHL) and in adiposity therapy. **Conclusions:** Overall, students showed a good understanding of illness related to metabolic syndrome with few false beliefs.

**T-323-P**

**Selective Bias by Metabolic Syndrome Definition in Metabolic Syndrome without Obesity**

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**Background:** Lipodystrophy is a disease characterized by low fat mass and increased insulin resistance. In actual clinical practice, some patients, with insulin resistance but low fat mass, share the characteristics of lipodystrophy patients. Prevalence and characteristics of these similar lipodystrophies in Korea are not well known. **Methods:** Korea representative data, the National Health and Nutrition Examination Survey 2010 data from the present study analyzed the prevalence and characteristics of the country of similar fat dys- trophy. We made Z-score of fat mass index [body fat mass (kg) / Height (m2)] with LMS method. We defined lipodystrophy-like patients as non-obese (BMI >25kg/m2 and waist circumference < 90 cm [male], < 85 cm [female], and Z score for fat mass index below 0) and insulin resistance (with metabolic syndrome). Metabolic syndrome followed the NECP criteria. **Results:** The prevalence of metabolic syndrome whose BMI was below 25 kg/m2 was 11.4% (over the age of 20) and 38.4% (over the age of 65). And the prevalence of lipodystrophy-like patients was 6.8% (over the age of 20) and 20.4% (over the age of 65). HOMA-IR of lipodystrophy-like patients (2.17±1.37) was significant higher than people without metabolic syndrome (1.91±1.83, p=0.001) and was significant lower than with patients with metabolic syn- drome and without lipodystrophy feature (2.78±2.16). **Conclusions:** In this study, a lot of patients showed the lipodystrophy-like feature. They showed increased insulin resistance without the relationship with obesity.

**T-324-P**

**Population Approach for Metabolic Syndrome: Efficacy of Visceral Fat Measurement and Its Relation with Diet/Lifestyle**

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**Background:** The objective of this study was to examine the efficacy of visceral fat measurement in a population approach to screen for metabolic syn- drome (MetS). Relationships between visceral fat and diet/lifestyle were also investigated. **Methods:** Japanese adult employees in six companies (male=3585, female=1857, mean body mass index [BMI] ± 22.5±3.1 kg/m2; mean age ± SD = 41±11 y) participated in a group health check-up held in each company. BMI, waist circumference (WC), and visceral fat area (VFA) using a bioelectrical impedance analysis (BIA) method were mea- sured. Diet/lifestyle was surveyed by a questionnaire containing 5 items with 5 ranking scales. The incidence of MetS was diagnosed by Japanese criteria for 5106 participants (male=3875, female=1231) whose body measurement data could be combined with their latest blood parameters and blood pressure measurements. Six factors of diet/lifestyle relating to obesity (overeating, irregular meal time, night eating, eating fast, quality of food, and sedentary be- havior) were scored by factor analysis of responses to a questionnaire. **Results:** Age-adjusted multiple linear regression analysis revealed that quality of food (vegetable, fish, etc.) was highly related to visceral fat, but not to BMI or WC. VFA had the highest correlation with components of MetS (dys- lipidemia, hyperglycemia) in male. The area under a ROC curve and the odds ratio were significantly greater for VFA than for BMI as an indicator for MetS (p=0.001, 0.026, respectively). These findings suggest that VFA is a su- perior predictor for screening a high-risk population for MetS. **Conclusions:** Visceral fat measurement using the BIA method is cost-effective and radiation-free as compared conventional computed tomography, and may be an ef- fective strategy to improve the incidence of MetS in a population approach.
Obesity 2013 Abstract Book
Poster Abstracts – Wednesday, November 13 to Friday, November 15, 2013

T-325-P
Impact of Consumption of Olive and Argane Oils on Anthropometric Profile of Postmenopausal Women in Morocco
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Background: Worldwide, large studies have shown that the menopause is mainly associated with substantial changes in body composition that result in an increase in waist circumference, fat accumulation and specially weight gain. This increase could be exacerbated by fat intake. Thus, this study was planned to evaluate the impact of the consumption of these olive and argane oils on anthropometric profile and body composition of postmenopausal women.

Methods: The nutritional intervention was conducted over a period of 8 weeks, involving daily consumption of 25 ml of olive oil or olive oil in 151 postmenopausal women (55.49 ± 6.18 years). The anthropometric profile (weight, height, BMI) and body composition (Fat mass and Lean mass) were determined at weeks 0 (Baseline), and after 4 and 8 weeks of nutritional intervention.

Results: Results clearly demonstrate that argane oil or olive oil consumption do’t affect the anthropometric parameters and the body composition of postmenopausal women.

Conclusions: Thus, argane and/or olive oils’ regular diet, does not lead to weight gain and postmenopausal women could benefit from their impact on health for a better quality of life and to overcome all menopause associated problems. A longer period of nutritional intervention is required to confirm the trend down that was recorded.

T-326-P
The Glycemic Responses in Lifestyles, Metabolic Syndrome and Obesity in Age-Stratified T2DM – Based on the Diabetes Case Management Program 2001, Taiwan
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Background: To evaluate the glycemic control in different lifestyles, metabolic syndrome and obesity in age-stratified T2DM for the ensuing development of individualized care program.

Methods: From Jan. 2007 to Dec. 2009, 2638 T2DM participating randomly and cumulatively in DCMP 2001 were under study. Accordingly, anthropometric and biochemical data were tri-monthly measured and, the total daily caloric intake, macronutrient consumption and dietary recommendation were also recorded. The normal (BMI≤24) and obese (27≥BMI) were defined. The lifestyles were categorized as lifestyle I (no smoking, no alcoholic and regular exercise) and otherwise lifestyle II. The MetS defined was based on the ATP III criteria. All the participants were classified obligatory by age under 7 subgroups, age 20-30, 30-40, 40-50, 50-60, 60-70, 70-80, and >80:

Results: The case distributions in lifestyle II, MetS/non-MetS and obese/non-obese with corresponding A1c and total daily energy intake (Kcal) in these 7 age-stratified T2DM were demonstrated in Table 1, 2 and 3 respectively. The A1c levels showed for meter-based pre-T2D was 5.7mmol/l (sensitivity and specificity both ≥6.1mmol/l for pre-T2D; the proportion of suspected cases were 4.8% (n=23) with meter and 7.1% (n=34) for laboratory. Using a cutpoint of A1c≥6.5mol/l (110mg/dl) for pre-T2D, the analysis suspected cases were 18.2% (n=87) and 17.2% (n=82) for the meter and lab, respectively. Agreement between meter and laboratory for detecting pre-T2D and T2D were 54.0% and 69.6%, respectively. The optimal cutoff point for meter-based pre-T2D was 5.7mmol/l (sensitivity and specificity both 74%; AUC=0.81); for T2D, it was 5.8mmol/l (69.5% sensitivity, 72.5% specificity; AUC=0.78).

Conclusions: We recommend lower cutpoints for Accu-Chek meters than lab-based cutoffs. While potentially useful for screening and prevalence estimates, meter-based measures are not diagnostic for early detection and prevention of these metabolic abnormalities are warranted.

T-327-PDT
Elevated Risk of Type 2 Diabetes and Hyperlipidemia but Not Hypertension in Urban Obese African American Adolescents
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Background: Type 2 diabetes (T2DM), hypertension (HTN), and hyperlipidemia are highly associated with obesity. The increase of childhood obesity also increases the risk of these diseases during youth. The aim of this study was to examine the prevalence of T2DM, HTN and hyperlipidemia in a sample of obese African American Adolescents (oAAA) compared to national data.

Methods: Laboratory blood assays were conducted on 123 oAAA living in a Midwest metropolitan area (mean age: 13.9±1.3yrs, 72% girls, mean BMI percentile: 98.8±1.1). Disease diagnosis was based on caregiver report.

Results: The rate of T2DM in oAAA was 7.3%, higher than both the general US adolescents and AAA prevalence based on the SEARCH study (0.042% and 0.11% respectively). The 3% rate of HTN in our sample is equivalent to the prevalence in the general adolescent population based on the NHANES data. OAAA had significantly lower triglyceride (TG) and total cholesterol (TC) levels compared to the recommended value (87 vs 150mg/dl p<0.01; 143 vs 170mg/dl p<0.01). Compared to the NHANES data, the oAAA, on average, has a lower TC/HDL ratio (3.6) than the general adolescent population (3.8). The ratio is also significantly higher than the recommended cut off point of 4 (p<0.01). This sample of oAAA has a higher prevalence of T2DM and a higher TC/HDL ratio compared to the national data.

Conclusions: These findings support that oAAA are at higher risk for the early onset of T2DM and hyperlipidemia but not hypertension compared to healthy weight youth. Further studies for the strategies for early detection and prevention of these metabolic abnormalities are warranted.

T-328-P
Diagnostic Value of a Glucose Meter for Screening and Surveillance in Seychelles
Elisabeth Muriki Maywood, IL; Pascal Bovet Lausanne, Switzerland; Lara R. Dugas, Amy Luke, David A. Shoham Maywood, IL

Background: Screening and surveillance for type 2 diabetes (T2D) rely on the ability to accurately measure fasting glucose. Laboratory methods are preferred, but are expensive and difficult to carry out in many contexts, including Africa. Methods: This study focuses on the accuracy of the Accu-Chek glucose meter to classify pre-T2D and T2D subjects in Seychelles. We sought to establish optimal cut-points for a sample population (n=500) analysis ROC curves. Results: Using the World Health Organization guidelines for DM of ≥7.0 mmol/l (126 mg/dl), the proportion of suspected cases was 4.8% (n=23) with meter and 7.1% (n=34) for laboratory. Using a cutpoint of A1C≥6.5mol/l (110mg/dl) for pre-T2D, we analyzed suspected cases were 18.2% (n=87) and 17.2% (n=82) for the meter and lab, respectively. Agreement between meter and laboratory for detecting pre-T2D and T2D were 54.0% and 69.6%, respectively. The optimal cutoff point for meter-based pre-T2D was 5.7mmol/l (sensitivity and specificity both 74%; AUC=0.81); for T2D, it was 5.8mmol/l (69.5% sensitivity, 72.5% specificity; AUC=0.78).

Conclusions: We recommend lower cutpoints for Accu-Chek meters than lab-based cutoffs. While potentially useful for screening and prevalence estimates, meter-based measures are not diagnostic and must be confirmed with laboratory methods. Furthermore, the meter could not distinguish between pre-T2D and T2D, as cutoffs for both are nearly identical.

T-329-P
Socioeconomic Status and Insulin Resistance Korea National Health and Nutrition Examination Survey 2008–2010
Jun Goo Kang, Anyang, Republic of Korea; Yang-Hyun Kim Ansan, Republic of Korea; Ki-Young Lee, In-Cheon, Republic of Korea; Chang Boom Lee Guri, Republic of Korea

Background: To investigate the relationship between socioeconomic status (SES) and insulin resistance in non-diabetic adult women. Korea National Health and Nutrition Examination Survey 2008–2010. Methods: We analyzed the Korean National Health and Nutrition Examination Survey (2008-2010). Adult participants aged ≥30 years without diabetes in adult women (participants 8,323). SES, as measured by house income or education level. Insulin resistance was assessed by homeostasis model assessment-insulin resistance (HOMA-IR). The adjusted OR for insulin resistance was calculated using a multivariate logistic regression analysis across house income and education level quartiles. Results: This study showed that SES and insulin resist-
The adjusted OR (95% CI) for insulin resistance for the lowest vs. highest quartile of house income and education level were 0.63 (95% CI 0.55-0.81) and 0.71 (95% CI 0.56-0.90) in MODEL1. The adjusted OR (95% CI) for insulin resistance for the lowest vs. highest quartile of household income and education level were 0.71 (95% CI 0.56-0.90) in MODEL2. However, such relationship was not found among education level in model2.

Conclusions: We found the relationship between SES, especially house income and insulin resistance in non-diabetic adult women.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Environmental Determinants of Health
T-330-P
Risk of Early Childhood Obesity Associated with Oral Antibiotics and Corticosteroids Administered During Infancy
Charles Bailey, Christopher B. Forrest, Pexzin Zhang, Thomas M. Richards, Alice Livshits, Patricia A. DeRusso Philadelphia, PA

Background: Medication use early in life has been implicated as a risk factor for obesity, but current evidence is limited. We examined whether exposure to oral antibiotics or steroids at specific times in infancy was associated with early childhood obesity. Methods: We conducted a non-concurrent cohort study of 84,679 children in the Children’s Hospital of Philadelphia’s primary care network. Longitudinal data (2001-2010) were retrieved from the EHR for visits from birth to age 6. Antibiotic, steroid, and ranitidine (negatively controlled) exposures were determined for the first 24 months of life and obesity was defined as a BMI greater or equal to the 95th percentile for age and sex during years 3-5 of life. Cox proportional hazards models were used to estimate the rate ratios (RRs) for the development of obesity. The rate of obesity was examined for those exposed and not exposed while adjusting for demographics, anthropometrics, diagnoses, geographic residence, practice site, and medication exposure. Results: Approximately 68% of children were exposed to antibiotics, 12% to steroids, and 13% to ranitidine in the first 2 years of life. The risk of obesity was associated with antibiotic exposure during the first 6 months of life (RR=1.08; 95% CI:1.02,1.14) and during months 13-18 (RR =1.09; 95% CI:1.04,1.15), and increased with the number of courses of antibiotics. Obesity risk was increased with exposure to steroids in months 13-18 (RR 1.16; 95% CI 1.00, 1.34) but no other time period. A diagnosis of reactive airway disease/bronchiolitis correlated with risk of obesity (RR 1.17; 95% CI 1.12,1.23). The risk of obesity was not associated with ranitidine exposure. Conclusions: Antibiotic and steroid exposures during infancy are each associated with increased risk of developing early childhood obesity, but age at exposure is an important modifier of this risk.

T-331-P
Prolonged Financial Stress Predicts Subsequent Obesity: Results from a Prospective Study of an Australian National Sample
Mohammad Siahpush, Terry Huang, Asia Sikora, Melissa Tibbits, Raees A. Shaikh Omaha, NE; Gopal K. Singh Rockville, MD

Background: The body of research investigating socioeconomic inequalities in obesity has paid little attention to the concept of financial stress, which is a direct indicator of economic deprivation. The aim of this research was to assess the effect of prolonged financial stress (FS) on subsequent obesity. Methods: Data were from Waves 8 (2008), 9 (2009), and 10 (2010) of Household Income and Labour Dynamics in Australia (HILDA) survey. The outcome was obesity measured in 2010. Prolonged FS was defined as having experienced FS in both 2008 and 2009. FS was measured in each year using seven questionnaire items. Analyses adjusted for health, physical activity, income, education, baseline obesity, and other covariates. Results: Prolonged FS was a strong predictor of subsequent obesity. The adjusted risk of being obese in 2010 were 20% higher (RR: 1.20; 95% CI: 1.10-1.30) among individuals who experienced FS in both 2008 and 2009 than those who did not experience FS in either year. The association of FS with obesity was independent of age and constant across income categories. Conclusions: Obesity prevention research should pay more attention to FS as an important dimension of economic deprivation, a concept that is distinct from common indicators of socioeconomic status such as income. Future research can examine the effect of financial education and counseling programs that help improve financial performance and reduce stress among individuals with such skills as money management, budgeting, and saving on a reduction in FS and obesity.
T-334-P
Short Sleep Duration As a Risk Factor for the Development of the Metabolic Syndrome in Adults
Jean-Philippe Chaput, Jessica N. McNeil. Ottawa, Canada; Jean-Pierre Després. Quebec City, Canada; Claude Bouchard. Baton Rouge, LA; Angelo Tremblay. Quebec City, Canada

Background: Studies that prospectively examine the association between sleep duration and the metabolic syndrome are lacking. The objective of this study was to investigate the association between self-reported sleep duration and the incidence of features of the metabolic syndrome in adults. Methods: A longitudinal analysis from the Quebec Family Study (Canada) was conducted on 2,933 participants, aged 18 to 65 years, followed for a mean of 6 years. Participants were categorized as short (<6 h), adequate (7-8 h) or long (>9 h) sleepers. The metabolic syndrome was defined according to the American Heart Association/National Heart, Lung, and Blood Institute’s criteria. The hypertriglyceridemic waist phenotype was defined as high waist circumference (≥90 cm in men and ≥85 cm in women) combined with high fasting triglyceride level (≥2.0 mmol/L in men and >1.5 mmol/L in women).

Results: The incidence rates of metabolic syndrome and hypertriglyceridemic waist phenotype were 9.9% and 7.5%, respectively. Short sleepers were significantly more at risk of developing the metabolic syndrome (RR: 1.82; 95% CI: 1.05-2.72) and the hypertriglyceridemic waist phenotype (RR: 1.82; 95% CI: 1.16-2.79), compared to those sleeping 7 to 8 h per night after adjusting for age, sex, smoking habits, highest education level, total annual family income, alcohol consumption, coffee intake, menopausal status, daily caloric intake, and cardiorespiratory fitness. However, long sleep duration was not associated with an increased risk of developing the metabolic syndrome or the hypertriglyceridemic waist phenotype (either unadjusted or adjusted models).

Conclusions: Short sleep duration may be an important risk factor for the development of the metabolic syndrome in adults.

T-335-P
Short Sleep Duration Is Associated with Features of the Metabolic Syndrome and with Overall Cardiometabolic Risk in Adults
Jean-Philippe Chaput, Jessica N. McNeil. Ottawa, Canada; Jean-Pierre Després. Quebec City, Canada; Claude Bouchard. Baton Rouge, LA; Angelo Tremblay. Quebec City, Canada

Background: The objective of this study was to examine the association between self-reported sleep duration and features of the metabolic syndrome in adults. Methods: A cross-sectional analysis from the greater Quebec City area (Canada) was conducted on 810 participants aged 18 to 65 years. Participants were categorized as short (<6 h), adequate (7-8 h) or long (>9 h) sleepers. The metabolic syndrome was defined according to the American Heart Association/National Heart, Lung, and Blood Institute’s criteria. Results: Overall, 24.6% of the sample had the metabolic syndrome. A U-shaped relationship between sleep duration and the prevalence of metabolic syndrome (33.3%, 22.0% and 28.8% in short, adequate and long sleepers, respectively) was observed (P<0.01). Only short sleepers had a significant increase in the odds of having the metabolic syndrome (OR=1.76, 95% CI=1.08-2.84) compared to adequate sleepers after adjustment for age, sex, smoking habits, highest education level, total annual family income, alcohol consumption, coffee intake, menopausal status, daily caloric intake, and cardiorespiratory fitness. However, long sleep duration was not associated with an increased risk of developing the metabolic syndrome or the hypertriglyceridemic waist phenotype (either unadjusted or adjusted models).

Conclusions: Short sleep duration may be an important risk factor for the development of the metabolic syndrome.

T-336-P
Common Genetic Variation Near MC4R Modulates the Relationship between Fast Food Restaurants and Body Mass Index

Background: Many human genes have been identified that are related to obesity including the fat mass and obesity-associated (FTO), serotonin (HT), melanocortin 4 receptor (MC4R), and opioid receptor (OP) genes. To date, no studies have explored the gene-food environment interaction on obesity. The food environment refers to the density of fast food restaurants, convenience stores, full-service restaurants, and supermarkets/grocery stores in a neighborhood. The primary purpose of the current study was to determine whether single nucleotide polymorphisms (SNPs) related to obesity interact with the food environment to predict body mass index (BMI). Methods: We measured 19 SNPs (FTO, HT, MC4R, and OP) in 203 men and women of varying BMI. A geographic information system was used to map attributes of the food environment, including the number of grocery stores and supermarkets, convenience stores, full-service restaurant, and fast food restaurants within each participant’s neighborhood. Linear regression was used to assess the effects of the food environment, SNPs, and the interaction of food environment x genetic polymorphisms on BMI, controlling for proportion of African ancestry. Results: Results showed an interaction between rs17782313 and number of fast food restaurants in predicting BMI (β=0.10, P<0.01). Individuals with one or two copies of the C allele on rs17782313 and who live near a greater number of fast food restaurants have a higher BMI. Conclusions: The rs17782313 risk allele is a genetic variant near MC4R that has been related to snacking and eating high fat food. Having this risk allele and living in an environment where there are more fast food service restaurants is associated with greater BMI. Future investigations need to determine if other obesity related genes moderate the relationship between BMI and the food environment.

T-337-POT
Walkable Built Environments Associated with Child BMI Z-Score: Data from Electronic Health Records

Background: Childhood obesity remains a prominent public health problem. Walkable built environments may prevent excess weight gain. The purpose of this study was to examine the association of walkable built environment variables with body mass index (BMI) z-score among a large sample of children and adolescents. Methods: We used geocoded residential address data from electronic health records of 49,770 children and adolescents aged 4 to <19 years seen at the 14 pediatric practices of Harvard Vanguard Medical Associates from August 2011 to August 2012. We created various geographic information system (GIS) walkable built environment variables (i.e. distance to nearest recreational open space, count of recreational open space, population density, residential density, traffic density, average speed limit, sidewalk completeness, intersections density and land use mix). The main outcome was BMI z-score. Multivariate models were adjusted for child age, gender, race/ethnicity and neighborhood median household income. Results: In multivariate models, lower quartiles of distance to recreational open space were associated with lower BMI z-score. For example, those in quartile 1 of the nearest recreational open space had a lower BMI z-score (beta: -0.06, 95% CI: -0.08, -0.03) compared to quartile 4 (reference). Lower quartiles of the count of recreational open space, population density, residential density, traffic density, sidewalk completeness, intersection density, and land use mix were associated with higher BMI z-score. Conclusions: Overall walkable built environments were associated with lower BMI z-scores in a large sample of children. Modifying existing built environments to make them more walkable may reduce childhood obesity.
OBESITY 2013 ABSTRACT BOOK
POSTER ABSTRACTS – WEDNESDAY, NOVEMBER 13 to FRIDAY, NOVEMBER 15, 2013

T-338-P
Parental Guidance Suggested: Associations between Parental Television Viewing Rules and Health Behaviors among Obese Children
Jennifer K. Cheng, Renata L. Koziol, Elsie M. Taveras Boston, MA

Background: Few studies have examined the relationship between parental limits on television (TV) viewing time and child lifestyle behaviors.

Methods: Parents of obese children ages 6-12 years completed a cross-sectional survey. The main exposure was parental limits in TV viewing time. Outcomes included screen-related behaviors (television in bedroom; eating breakfast or dinner with the TV on; hours watching TV, playing video games, and using internet); time spent walking, in light/moderate, or vigorous physical activity; sleep duration; frequency of falling asleep while watching TV; frequency of eating family dinners. We performed bivariate and multivariable analyses to examine independent associations of parental TV viewing rules with our outcomes.

Results: Of the 816 children enrolled, 53% were White, 20% Black, 15% Hispanic, 13% Other; 57% of their parents had a college education and 74% of parents were overweight or obese. In multivariable analyses (adjusted for child age, sex, race/ethnicity; parental education & US-born status; household income and primary language), children whose parents set TV time limits were less likely to have a television in the bedroom (OR=0.45; CI:0.31, 0.64), to eat breakfast (OR=0.73; CI:0.53, 0.99) or dinner (OR=0.53; CI:0.39, 0.73) with the TV on, and to fall asleep while watching television (OR=0.34; CI:0.21, 0.57). Children with limits on TV time spent fewer weekday hours watching TV (beta=-0.38; 95%CI:-0.54, -0.21) playing video games: (beta=-0.15; CI: -0.25, -0.04), and using the internet: (beta=-0.08; CI: -0.15, -0.01). In addition, children with TV time limits had longer sleep duration during weekdays: (beta=0.21; CI: 0.05, 0.36).

Conclusions: Parental limits on TV viewing may be a focus of intervention to improve obesogenic behaviors including screen media time and sleep duration among obese children.

T-339-P
Training of Schools Nurses on a Family-Centered Approach to Modify Diet and Physical Activity Practices of Students at Risk of Obesity and Its Complications: A Pilot Study
Wendy Palmer, Michele Wimbush, Cheryl Williams, Cagney Stigger, Jean A. Welsh Atlanta, GA

Background: School nurses are uniquely qualified and positioned to provide guidance and support to children at risk for obesity and its complications. The purpose of this study was to test the acceptability and impact of a training designed to 1) build skills in family-centered counseling and 2) promote the use of applicable pediatric obesity prevention and treatment recommendations.

Methods: In early 2013, all nurses (n=28) in one large metropolitan school district serving over 90,000 students attended a baseline 2-hour training and a 1-hour webinar one month later. Pre and post, self-administered questionnaires were used to assess knowledge, attitudes, and practices. McNemar’s tests were used to assess the change. Results: With training, there was an increase in the proportion of nurses knowledgeable about the BMI cut-off used to define obesity (6% to 63%) and the goal of maintaining weight with growth rather than weight loss for overweight children (82% to 100%). The proportion of nurses confident in their ability to effectively communicate with students and their parents for behavior change and to apply obesity prevention and treatment recommendations increased from 50% to 74% and 44% to 94%, respectively. Lack of: parent support (40%), time (40%), and effective tools and information to give children and/or parents (32%) were the top 3 most commonly cited barriers to school nurses’ ability to provide diet and weight-related guidance to students. Conclusions: A brief training for school nurses resulted in increased knowledge and confidence to effectively guide and support students and their parents regarding their weight management related needs.

T-340-PDT
Disentangling the Simultaneous Influence of Neighborhoods and Schools on Adolescent Body Mass Index
Tracy K. Richmond, Erin C. Dunn, Carly Milliren, S. V. Subramanian Boston, MA

Background: Neighborhoods and schools have independently been shown to influence adolescent weight related outcomes. However, prior studies’ focus on one context at a time ignores the reality that individuals exist simultaneously in multiple contexts that could influence health. Our objective was to examine and compare the simultaneous influence of schools and neighborhoods on individual Body Mass Index (BMI).

Methods: Analyzing data from a nationally representative sample of adolescents in grades 7-12 (n=18,200), we used cross-classified multilevel models to examine both the fixed and random effects of individuals, schools, and neighborhoods on adolescent BMI. We specifically compared associations of sociodemographic markers at the individual-, school-, and neighborhood-level with BMI (fixed effects). We also compared the relative contribution of individuals, schools, and neighborhoods to the variance in individual BMI (random effects).

Results: There were 18,200 students nested in 128 schools and 2259 neighborhoods, with 2757 unique combinations of schools and neighborhoods. Approximately 25% of students attended schools that were sociodemographically different from their neighborhoods (p<0.001, McNemar’s chi squared). Both living in a neighborhood and attending a school with a higher proportion of individuals with parents having at least a high school degree were associated with on average lower individual BMI. Neighborhoods (p=0.14, s.e.=0.061) and schools (p=0.073, s.e.=0.030) both contributed significantly to the variance in individual BMI, though the effect of neighborhood was nearly twice that of schools. Conclusions: Though both schools and neighborhoods contribute significantly to individual BMI, neighborhoods appear to contribute more. This has potential implications for where to target weight related interventions.

T-341-P
Differential Community Characteristics Associated with Obesity Prevalence between the South and Non-South United States (U.S.)
Candice A. Myers, Tim Slack, Corby K. Martin, Stephanie Broyles, Steven B. Heymsfield Baton Rouge, LA

Background: Obesity prevalence is not randomly distributed across the U.S. In this study we identified regional differences in obesity prevalence and community characteristics associated with observed regional differences.

Methods: The present analysis used county-level obesity estimates (percent of the adult population [≥20 years] that is obese [BMI≥30kg/m2]) within a county. Means ±SD obesity prevalence in the 3,109 contiguous U.S. counties was 30.3±4.2% with a range of 13.5-47.9%. Regional differences in obesity prevalence were assessed with an independent samples t-test. Two spatial regression models were estimated for the South and the non-South with z-test procedures to test for significant differences between models. Results: County-level obesity prevalence in the South (Means±SD, 32.9±3.7%) was significantly higher than the non-South (p<0.001). Three community characteristics had significantly stronger positive correlations with obesity prevalence in the non-South compared to the South: unemployment (p<0.001), residential segregation between poor and non-poor populations (p<0.006), and the adult population with less than a high school degree (p<0.005). One community characteristic emerged as having a significantly stronger positive association with obesity prevalence in the South compared to the non-South: African American populations (p<0.001). Conclusions: Obesity prevalence is significantly higher in the South versus the non-South with differential community features associated with obesity prevalence between the two regions. African American populations emerged as having a significantly stronger association with obesity prevalence in the South, and while not a modifiable predictor of obesity, this association suggests underlying characteristics (e.g., cultural norms related to diet, physical activity, and weight) that may be intervention targets.

T-342-P
Cross-Sectional and Longitudinal Associations of Environmental Factors Associated with BMI Trends in an Employed Population
Kristina H. Lewis, Edmund R. Becker, Douglas W. Roblin Atlanta, GA

Background: Most adults gain weight over their life course, increasing risk/severity of cardiometabolic disease. Psychosocial and environmental stressors may contribute to weight gain and have been suggested as a point of intervention Methods: Using electronic medical record and survey data, we studied 2,029 African American and Caucasian HMO members 25-59y of age, and randomly sampled from 3 condition cohorts: type 2 diabetes (T2DM), dyslipidemia, and low-risk (no major morbidity). A 2005 written survey measured psychosocial stress (friends/family, worklife, 0-100 scale, www.obesityweek.com

For author conflict of interest information, see page 5264
most to least), lifestyle (diet/physical activity [PA], 0-100, worst to best), and residential built environment (RBE, 0-100, worst to best for promoting PA). Body mass index (BMI) trajectories were estimated using growth curve models for BMI from '05-'09. Independent variables were '05 support/stress, lifestyle, and RBE. Interactions of these factors with time from '05 baseline were tested. Results: Median baseline age was 50 years; 61% were female; 49% were AA; 30% had T2DM, 36% dyslipidemia, and 34% low risk. Mean '05 BMI was 30.8 (SD 7.0), and rose over a 4-year period (0.14 kg/m², p<0.01). In baseline cross-sectional models, lower stress and better RBE scores correlated with lower BMI (both β = -0.04 kg/m²; scale point; p<0.01). Longitudinal models ('96-'09), however, showed no effect of interaction of stress score with time on BMI trajectory (p=0.5), while better RBE score, surprisingly, predicted more weight gain (RBE×period interaction term p=0.02). Conclusions: While factors such as social stress/support and the RBE are cross-sectionally (α≥) associated with average BMI, lower baseline stress and better RBE do not appear to protect against intermediate (1-4y) weight gain in an employed population of insured adults.

T-343-P
Mothers' Perceptions of Causes and Ways to Prevent Overweight in Young, Low-Income Children
Cynthia A. Danford Pittsburgh, PA; Celeste M. Schultz, Katherine Rosenblum, Alison Miller, Julie C. Lumeng Ann Arbor, MI
Background: Given the persisting prevalence of obesity in young children, more effective prevention and intervention programs are needed. The development of effective programming requires an understanding of mothers' perceptions of causes and ways to prevent child overweight. This study aimed to examine (1) mothers' perceptions of causes of childhood overweight; and (2) mothers' perceptions of ways to prevent young children from becoming overweight. Methods: Mothers (n=251) of low-income children, ages 4-7 years, in the Midwest (70% non-Hispanic white; 76% mothers and 43% children overweight/obese) were asked in a semi-structured interview, "What causes a child to be overweight?" "What can parents do to prevent their child from becoming overweight?" and "Do you do any of these things?" Interviews were transcribed. Interrater reliability was established (κ=0.70) and responses were coded into 12 themes. Content analysis followed. Results: Mothers identified dietary intake (food) (90%), parenting practices (47%), and limited physical activity (41%) as causes of overweight. Few identified limiting sugar-sweetened beverages (13%) or screen time (19%) as ways to prevent overweight. Mothers with higher BMI were more likely to identify parenting practices as a cause of child overweight (p=0.018). Mothers with less education were less likely to identify limited physical activity as a cause as a way to prevent child overweight (p=0.04) and less likely to identify promoting physical activity as a way to prevent child overweight (p=0.01). Conclusions: Understanding parent perceptions of causes and ways to prevent children from becoming overweight will provide direction in tailoring successful, individu-alized interventions to establish healthy habits.

T-344-P
The Association between Ways of Coping and Obesity in Mexican Adults
Guadalupe Ramirez-Lopez, Maria Elena Aguilar-Aldrete, Martha P. Hurtado-Perez, Antonio Jimenez-Alvarado, Edna Jareggu-Ulloa, Cristina Moran-Moguel, José Sánchez-Corona Guadalajara, Mexico
Background: Overweight prevalence in Mexico is 70.5% and one of the highest in the world. The ways of coping (WOC) stressful situations may increase the risk for developing chronic diseases. The relationship between WOC and obesity in adults from Guadalajara, Jalisco, Mexico was evaluated. Methods: Two hundred Mexican adults (20-67 years) participated in a cross-sectional study. Sociodemographic variables included: age, socioeconomic status (SES), years of study and civil status. Overweight and obesity were defined as ≥25 kg/m² and ≥30 kg/m², respectively. Questionnaires used were: 1) WOC questionnaire included the scales of: confrontative coping, distancing, self-controlling, seeking social support, escape-avoidance, problem solving and positive reappraisal, and 2) Food frequency questionnaire. Statistical analysis included multivariate logistic regression analysis. Results: Overweight and obese frequencies were 38.5% and 30%, respectively. Obesity was higher in less-educated (p<0.001), lower SES (p=0.006) and less active (p=0.037). All WOC scales were different among obese vs. non-obese; however, escape-avoidance scale (p=0.021), and positive reappraisal scale (p=0.037) were the only statistically significant. Logistic regression analysis showed associations between obesity with positive reappraisal (OR=0.98, p=0.009), and with escape-avoidance (OR=1.02, p=0.049). When these associations were analyzed by years of study, both associations were maintained (OR=.096, OR =1.03, respectively, p<0.05 for both). When stratified by SES, a positive reappraisal was detected in obese for lower SES (OR=0.96, p=0.034). Conclusions: Obesity is associated with higher internal/external demands on stressful encounters, and these are more important in lower academic degree and lower SES. These variables should be taken into account when designing obesity interventions.

T-345-P
Employment Status, Meal Preparation Time and Family Meal Frequency among New Immigrant Mother-Child Dyads
Sarah Sliva, Aviva Must, Flavia Perea, Christina D. Economos Boston, MA
Background: Family meals may protect against child obesity, yet mothers identify work-related time constraints among barriers to meal preparation and frequent family meals (FFM). Methods: Data were derived from Live Well, a community-based participatory-research intervention to prevent excessive weight gain among recent immigrant mothers (<10 years in US) in Greater Boston. Participants reported baseline socio-demographics and eating-related behaviors. Mothers reporting eating dinner with their child, not in front of the TV, ≥5 times/week, were categorized as having FFM (N=380). Logistic regression models estimated the likelihood of FFM from employment status and perceived meal-preparation time (more than enough, just enough, not enough), adjusting for household characteristics; an employment-by-meal-preparation interaction was tested. Results: Over 40% of mothers reported FFM; 26% perceived “more than enough” time to prepare meals, 61% “just enough” and 12% “not enough”. Non-working mothers were 2.3 times (95% CI: 1.4-3.8) more likely to have FFM than those working part-/full-time. Perceived meal-preparation time modified this relationship. In the full model (N=342), working mothers with “just enough” time were 6 times more likely to eat FFM (OR 5.9, 95% CI: 1.9-18.1) than those reporting “more than enough” (referred) and 2.5 times more likely than those with “not enough” time (95% CI: 0.9-6.8, p=0.08). Stratification by child age (<6 years old) strengthened associations. Conclusions: Non-working mothers were more likely to have FFM than those working part-/full-time. Working mothers who perceived having “just enough” time were significantly more likely to have FFM than those with “more than enough” or “not enough” time. Interventions looking to promote family meals should consider the time constraints of working mothers.

T-346-P
Change in Obesity Prevalence Across the United States (U.S.) and Associated Community Characteristics
Candice A. Myers, Tim Slack, Corby K. Martin, Stephanie Broyles, Steven B. Heymsfield Baton Rouge, LA
Background: Recent research has demonstrated significant associations between county-level risk factors and obesity prevalence in the U.S. using cross-sectional data. This study utilizes a longitudinal design to identify community characteristics that are associated with change in obesity prevalence. Methods: This analysis used county-level obesity estimates (percent of the adult population ≥20 years that is obese (BMI≥30kg/m²) within a county). Change in county-level obesity prevalence was calculated between 2004 (Time 1) and 2009 (Time 2). Associated county-level behavioral patterns and measures were assessed with regression analysis using a difference model with both dependent and independent variables measured as change scores (Time 2 – Time 1). Results: Mean±SD [range] change in obesity prevalence for the 3,109 contiguous counties was 5.1±2.4% [3.7 to 14.1%]. Between 2004 and 2009, obesity prevalence decreased in 1.4% (44) and increased in 98% (3,060) of counties, while 0.2% (5) had no change; and was significantly different (p<0.001) between the time points. Regression analysis showed associations between obesity change with physical inactivity A having the strongest positive effect. Seven parameters were negatively associated with change in obesity prevalence with obesity prevalence in 2004 having the strongest negative effect. Conclusions: This study demonstrates that most counties in the U.S. experienced increases in obesity prevalence from 2004 to 2009 and extends the literature by identifying key community correlates associated with this change. The findings help to highlight local level social change associ-
ated with the obesity epidemic and identify areas at highest risk of increasing obesity.

T-347-P
A Time Series Analysis of a Food and Beverage Labeling Intervention in a Hospital Cafeteria
Jason P. Block, Heather J. Baer, Katherine D. McManus Boston, MA

Background: No long-term studies using time series analyses have evaluated food and beverage labeling in a workplace cafeteria. Methods: Starting in January 2012, in the Brigham and Women’s Hospital cafeteria, we assigned all food and beverage items to a green (healthiest), yellow, or red (least healthy) label based on calorie, fat, sodium, and sugar content. From an electronic, check-out scanner, we captured weekly sales data for each item sold during one year of baseline before (2011) and one year after labeling (2012). We also surveyed a convenience sample of employees visiting the cafeteria in the month before (N=188) and 9 months after (N=201) labeling. Results: During baseline, the weekly green, yellow, and red items sold (%) were: beverages 1679 (20%), 1997 (24%), 4715 (56%); sides 983 (11%), 239 (13%), 7334 (86%); entrees 3507 (32%), 607 (6%), 6915 (63%), respectively. In the time series analyses, we saw an immediate increase (change in level) of 253 green beverages/week (95% CI 138, 367) after labeling but a declining trend change of 12 bev/ wk (95% -8, -16), demonstrating a reversion to the baseline by the end of 2012. We noted a similar pattern for green and yellow side items and for green entrees. For yellow beverages, we saw both a level (408 bev/wk, 95% CI 298, 517) and trend (15 bev/wk, 95% CI 12, 19) change increase after labeling. Red side items had only a level change increase of 571 items/wk (95% CI 232, 910). We found no significant change for red beverages, yellow side items, or red entrees after labeling. In the survey, 72% of employees noticed the labeling program; approximately 1/3 rated the cafeteria offerings as “healthy” both before and after. Conclusions: A labeling program in a hospital cafeteria had beneficial effects on sales of the healthiest beverages, sides, and entrees but the effect abated over time.

T-348-P
Chain and Individual Differences in Meat Calorie Content at Fast Food Restaurants
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Background: Limited data are available regarding actual calorie content of fast-food restaurant meals. Methods: In 4 New England cities in 2010 and 2011, we made repeated visits to 89 chain fast-food restaurants: McDonald’s, Burger King, Wendy’s, Subway (all age groups), KFC (adults, school-age children only), and Dunkin’ Donuts (adolescents only). We surveyed 1877 adults, 1178 adolescents, and 330 (parents of) school-age children. We collected meal receipts, demographic information, and self-reported height and weight. We calculated the actual calorie content of meals purchased using receipts and nutritional information from restaurant websites. Results: The mean age of adults, adolescents, and school-age children was 37.2, 16.1, and 7.9 years; 57%, 51% and 48% were male; and 62%, 82%, and 81% were minority race/ethnicity, respectively. The median meal calorie content was 790 kcal (IQR 480,1130), 698 kcal (406,1070), and 670 kcal (510,920). In multivariable analyses, adult diners at all chains had significantly larger meals than at McDonald’s (relative difference, 34% to 65% more calories). Among adolescents, only diners at Subway had significantly larger meals than at McDonald’s (95% CI 38%,61%). We did not find differences across chains for school-age children. Other predictors of higher meal calorie content included male sex, younger age and higher BMI for adults; male sex, and Black or Hispanic race/ethnicity for adolescents; and older age for school-age children. Conclusions: Meal calorie content differs across fast-food restaurant chains. Compared with McDonald’s, adults purchase larger meals at all other chains; among adolescents, only Subway diners purchase larger meals.

T-349-P
Effect of Walkability on BMI Mediated by Physical Activity: Evidence from the Continuous NHANES
Richard Scribner, Claudia Leonardi, Melinda Sothorn New Orleans, LA

Background: Measures of neighbourhood walkability have been linked to increased physical activity and lower rates of overweight and obesity. Certain waves of the Continuous NHANES have direct measures of all three constructs permitting analyses assessing possible mediation. Methods: Multilevel analysis of Continuous NHANES participants (i.e., waves 2003-2004 and 2005-2006) (n=4,190) nested in census tract of residence (n=1,092) were conducted. Body Mass Index (BMI) was obtained from direct measurement of height and weight. Measures of walkability at the census tract level included intersection density, mean block length, link to node ratio, and the gamma index. Physical activity was measured by accelerometer. Additional individual level covariates associated with BMI were included in models (i.e., age, race, ethnicity, gender, family income, marital status, education, smoking status, and nativity). Results: ANOVA analysis revealed that 4.1% of the variance in BMI was explained by the census tract of residence. Most measures of census tract level walkability were negatively associated with BMI in multilevel analyses, an effect that emerged only when individual level covariates were included in the models. The individual measure of physical activity (i.e., accelerometer) was strongly associated with BMI and explained most of the effect of the census tract walkability. Conclusions: The findings indicate census tract level measures of walkability explain the distribution of overweight and obese individuals across the US. An effect partially explained by a measure of physical activity, suggesting the effect of neighbourhood walkability is mediated by increased levels of physical activity in more walkable neighbourhoods.

T-350-P
Geographic Distribution of Overweight and Obese Participants in NHANES Partially Explained by Elevation of Residence
Richard Scribner, Claudia Leonardi, Melinda Sothorn New Orleans, LA

Background: Higher leptin levels have been associated with chronic exposure to high altitudes. The NHANES provides an opportunity to determine whether elevation of residence is associated with Body Mass Index (BMI). Methods: Multilevel analysis of Continuous NHANES 2003-2006 participants (n=4,190) nested in county of residence (n=104) were conducted. BMI in the Continuous NHANES was obtained from direct measurement of height and weight. County elevation was obtained from the National Elevation Database (NED) for the each county centroid. Additional individual level covariates associated with BMI were included in models (i.e., age, race, ethnicity, gender, family income, marital status, education, smoking status, and nativity). Results: ANOVA analysis of BMI in empty multilevel models demonstrated that 4.12% of the variance in BMI was explained by residence location. Multilevel analyses demonstrated a strong effect for elevation of county of residence and BMI. This translates into 0.31 BMI units per 1,000 feet of elevation. Controlling for relevant individual covariates associated with overweight and obesity did not reduce the effect. Conclusions: Elevation of residence is associated with BMI such that the geographic distribution of participants in the Continuous NHANES is partially explained by the elevation of the participant’s county of residence.

T-351-P
Focus on Green Eating: What Are College Students’ Perceptions of Environmentally Conscious Eating?
Jessica Nash, Geoffrey W. Greene, Alison Tovar Kingston, RI

Background: Green eating can be described as making environmentally conscious food choices. Increasing green eating has the potential to reduce environmental degradation and improve diet quality. There is limited information however on the knowledge and perceptions of green eating among college students. Methods: Nineteen 18 – 24 year-old full-time female students at a public, Northeastern university participated in four focus groups stratified by stage of change for green eating precontemplation/contemplation or preparation/ action/maintenance; 2 groups per stage were conducted. Results: The majority of the students perceived green eating to be choosing organic foods, shopping at farmers’ markets, consuming more fruits and vegetables and less meat and processed foods. Benefits of green eating were described as: consuming less chemicals, supporting local

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preschool children were more likely to prefer unhealthy foods than ESC and OW/OB children were less likely to prefer healthy foods.

Background: A better understanding of temperatures an individual experiences and its association with body composition may lead to greater understanding of barriers to outdoor physical activity. Current methods for estimating heat exposure and time spent outdoors such as weather station data, activity logs, or GIS instruments may lack accuracy, are expensive or raise privacy concerns. Methods: We set out to determine whether a small, inexpensive temperature/sunlight monitor attached to the shoe could be used to estimate heat exposure, thermal preference, and time spent outdoors simultaneously. Community partners in rural and urban areas recruited participants (N=80) to wear monitors for one week. Height, weight and body composition measurements were taken and participants recorded their activities and locations (inside or outside) on an hourly basis. Results: In response to an exit survey, most participants (86%) found wearing the monitor on their shoe was very comfortable and reported the monitor was not hard to remember to wear (81%) and 68% reported becoming more aware of the time they spend indoors and outdoors upon receiving a graph of the monitor’s output at the turn-in session. Nighttime temperatures and sunlight measurements were used to estimate thermal preference and time spent outdoors, respectively. When data from the individual monitors were compared to data from the closest weather station, weather stations overestimated average heat exposure. In contrast, daily maximum temperatures from a nearby weather station underestimated maximum temperatures experienced by urban participants. Conclusions: In conclusion, we have demonstrated an improved, inexpensive method for heat exposure and time spent outdoor estimation.

T-355-P

Winning the Obesity Battle in the Bronx: The Bronx Campaign to Prevent and Control Obesity

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Background: In response to the obesity crisis in the Bronx, where the prevalence of obesity and diabetes are 31% and 13%, respectively, the Health Department, Montefiore Medical Center, elected officials, and other key partners are focusing on the five evidence-based strategies to reverse the epidemic. Methods: We use a collective impact framework to implement a socio-ecologic approach centered around improving access to healthy foods, decreasing consumption of unhealthy foods, and increasing physical activities by expanding interventions in 1) worksites; 2) retail settings; 3) health care centers and 4) schools; and by implementing 5) educational campaigns. We will measure our impact with process measures and the NYC Community Health Survey which tracks population behaviors like sugary drink and fruit and vegetable consumption, physical activity related to active recreation and active transportation, and height and weight. Results: 15 organizations have agreed to align resources around a common agenda. To date, 9 hospitals and 70 retailers are improving their food environments; two health care centers are writing prescriptions for produce and making referrals to the YDPP; 950 elementary school teachers have been trained to lead in-class physical education; and one citywide media campaign has been placed more intensively in the Bronx and work to amplify these results is underway. Trends in obesity, diabetes, and sugary drink and fruit and vegetable consumption are being monitored. Conclusions: Progress has just begun and commitments to further expand this work will ensure broader reach and greater impact than possible by any one organization alone.
There were no racial differences in the receipt of advice. The associations between advice and weight loss attempts indicate possible value for such comparisons. Heart rate results did not differ by sex or school. The proportion of overweight/obesity was 19.2%; obesity prevalence was 12.9%. Both were higher than in the classroom. Daily in-school step counts averaged 1070 steps. In-school physical activity was estimated with Omron HJ-151 pedometers. Continuous heart rate data were analyzed using generalized estimating equations and Tukey-Kramer pairwise comparisons. Results: Prevalence of overweight/obesity was 19.2%; obesity by BMI matched abdominal obesity by waist circumference at 11.5%. Seated resting heart rate was 91 ± 11 bpm. Average continuous heart rate during PE (129 ± 30 bpm) was greater than during recess (116 ± 29 bpm); both were higher than in the classroom (109 ± 26 bpm, p < 0.001 for all pairwise comparisons). Heart rate results did not differ by sex or school. The proportion of time spent in MVPA was 29.5 ± 16.8% for PE, 14.3 ± 11.9% for recess, and 9.1 ± 3.1% in the classroom. Daily in-school step counts averaged 4630 on PE days and 3745 on non-PE days (p = 0.001). PE was held twice/week. Conclusions: School policies should promote daily PE and recess to optimize physical activity intensity and quantity.
Through several marketing techniques that promote inexpensive and unlabel. All packages with complete nutritional information were classified as which 32.7% were spokes characters. Premium offers were found in 34.0% most commonly used technique was promotional characters (92.5%) of

**Background:** A recent study showed that among women of a Mexico-US border city, TV advertisements influence the purchase and consumption of unhealthy food by children. The objective of this study was to assess the association between food advertisement and consumption of those products by women and children from a Southeastern Mexican City

**Methods:** Two national, Mexican television channels were recorded during the schedule of highest audience during October, 2011. Interviews were conducted on women with children one to five years old. A questionnaire about TV habits and advertisements was applied. Anthropometric measurements of mothers and their children were taken

**Results:** A total of 200 mothers and their children were evaluated. Forty three percent of the mothers were overweight or obese, and 20% of 1 to 6 year old children were at risk of overweight, overweight or obese. A total of 1915 advertisements were registered, of which, 29% corresponded to foods. The most frequent advertised foods were salty foods, whole dairy products, pastries, sweetened cereals, juices, and carbonated beverages. Eight food advertisements were broadcasted every thirty minutes. A positive correlation was found between the frequency of the foods advertised on TV and the consumption of these by the mothers (r=0.34, p=0.005). It was not observed association between the frequency of food advertisements and the consumption of these foods by children.

**Conclusions:** The exposition of food advertisements on TV is associated with their consumption by mothers from Southern Mexico

**T-361-P**

**Child-Oriented Marketing in Snack Food Packages in Guatemala**

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**Background:** Guatemala is currently struggling with high stunting and obesity prevalences, both coexisting in urban school-aged children. While food marketing is known to significantly contribute to childhood obesity, in Guatemala evidence on snack food marketing to support evidence based policies is lacking. This study sought to identify the marketing techniques used in child-oriented snack food packages sold near public schools in Guatemala.

**City:** City: We purchased all child-oriented snack food packages sold in stores within 200 square meters from four conveniently selected schools in an urban community. A snack was classified as child-oriented if the package had any promotional characters, premium offers, children’s television/movie tie-ins, sports references, or the word “child”. Packages were coded using a checklist that assessed child-oriented references and price. Snack foods were classified as “healthy” or “less healthy” according to the UK standards for the Nutrient Profile Model.

**Results:** We analyzed 106 packages found in 55 stores. The most commonly used technique was promotional characters (92.5%) of which 32.7% were spokes characters. Premium offers were found in 34.0% of packages, which were mostly collectibles (50.0%). Median (interquartile range) price was USD 0.19 (0.25). Most (86%) packages had a nutritional label. All packages with complete nutritional information were classified as “less healthy”.

**Conclusions:** In Guatemala, food companies target children through several marketing techniques that promote inexpensive and unhealthy snacks in the school environment. Our data should aid healthcare advocates to push for strong policies that restrict the use of promotional characters in snack food packages in order to halt the obesity epidemic.

**T-362-P**

**Perceptions of Obesity as a Policy Issue: Differences between Healthcare Professionals and the General Public**

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**Background:** Obesity is a complex problem and the subject of contentious policy debates. Scientific understanding of obesity is incomplete. Policy stakeholders hold contrasting views that influence investment in research, prevention, and treatment. This study examines the prevalence of views on obesity as a personal, community, or medical problem in the general public and among healthcare professionals.

**Methods:** Through a validated online survey, a sample projectable to the U.S. adult population of 10,556 general population (POP) and 1,077 healthcare professional (HCP) respondents was asked whether they viewed obesity primarily as a personal, community, or medical problem. The HCP sample included registered nurses (RN), physicians (PHYS), dietitians and nutritionists (DN), and Healthcare Policy and Management professionals (HPM). We compared both POP and HCP respondents by their views of the problem of obesity using chi-square tests with standardized residuals for categorical variables. Analyses were also stratified according to gender, urban density, and age.

**Results:** More POP than HCP respondents (40% v 29%, p<0.01) view obesity as a personal problem of bad choices. HCPs were closely divided between views of obesity as a personal (29%), community (27%), or medical problem (32%). Among HCPs, PHYS were more likely (38% v 28%, p<0.01) than RNs to view obesity as a medical problem. POP respondents that were female, younger, or urban were less likely (p<0.01) to view obesity as a personal problem of bad choices. The most common response of HPMs was to view obesity as a personal problem.

**Conclusions:** These data describe conflicting views about obesity. The common view among HPM and POP respondents of obesity as primarily a personal problem of bad choices suggests that barriers remain to integrating obesity treatment into routine systems of medical care.

**T-363-P**

**Employer Wellness Programs, Weight Outcome Hurdles and Obesity Treatment Access**

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**Background:** Under provisions in the Affordable Care Act in 2014, employers may impose substantial penalties on employees who don’t meet specific wellness goals, including BMI. Horwitz et al recently found that such programs can have the effect of shifting healthcare costs onto employees, without promoting wellness. The present study examines the prevalence of these practices in early 2013.

**Methods:** Through a validated online survey, a sample of 7788 respondents projectable to the U.S. adult population were asked if their employer: • Requires wellness plan participation to receive full health benefits • Sets goals for weight and other health indicators • Covers treatment for obesity under their health plan We conducted qualitative interviews with affected employees about their experiences.

**Results:** The total respondent pool of 7788 U.S. adults yielded a relevant sample of 5382 employed adults. Of those, 849 (16%) reported that their employer required participation in a wellness program to qualify for full health benefits. Most (67%) of respondents whose employers required wellness program participation also reported that the plan set wellness goals for one or more of the following health indicators: weight (41%), blood pressure (38%), exercise (36%), cholesterol (35%), or diet (25%). But a majority (59%) also indicated that their employer’s health plans did not cover any of the following evidence-based treatments for obesity: fitness training (22% covered), dietitian (14%), medical weight loss clinic (11%), weight loss surgery (9%), and weight loss drugs (8%).

**Conclusions:** Employers who require wellness program participation for access to full health benefits frequently set weight goals for employees, but do not typically cover evidence-based obesity treatment plans in their health plans.

**T-364-P**

**Assessing the Obesity Research Agenda: A Survey of the Obesity Society’s Membership**

Emily J. Dhurandhar Birmingham, AL; Gwyn Cready, Theodore K. Kyle Pittsburgh, PA; Richard L. Atkinson Richmond, VA

**Background:** Improving treatment and prevention of obesity requires novel research to test innovative hypotheses that will advance our understanding of the disease. Research resources are limited, so it is imperative that the available resources are allocated to the most novel and promising hypotheses. To assess the current obesity research environment and identify potential barriers or facilitators of novel research, we conducted a survey of attitudes and experiences of obesity researchers in the Obesity Society.

**Methods:** An online survey was administered via email to the members of the Obesity Society, the leading scientific society dedicated to the study of obesity, in November, 2012. In total, 331 (15% of members) completed the survey. Demographics were collected for respondents, and statements assessing the research environment were rated using a 5-point Likert scale.

**Results:** 65% of TOS members strongly agree that novel interventions are needed to treat obesity, whereas only 27% of respondents strongly agree that ongoing obesity re
search is novel, and 80% do not feel strongly one way or the other about the likelihood that it will improve our ability to treat obesity. And among respondents who have applied for a research grant, about half (52%) say they have an idea that could result in significant novel findings that they have not submitted because they feared it would be deemed unfundable. **Conclusions:** The future of obesity research depends on novel findings. A majority of respondents believe current research is not novel and expressed reluctance to submit novel ideas due to fear of rejection. This information can be used by funding agencies and researchers to improve the research environment so that testing of novel hypotheses is encouraged and supported.

**T-365-P**

**Labeling in Practice: An Experimental Study on the Use of Food Labels to Control Portion Size in Chile**

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**Background:** Nutrition labeling, if applied correctly and if adequately used and understood, can be an easy and direct tool in order to help consumers taking into account the nutritional content of the food product in their purchase decisions. The present study was conducted in order to understand consumer attitudes and understanding of portion size information on commonly consumed products. **Methods:** An experimental trial was performed on a sample of Chilean mothers and one of their relative. The study was developed in two phases. In the first one, participants were asked to prepare two meals (one meant for a child, one for an adult), with ingredients measured only with kitchen tools. Participants were stratified by portion size information in two groups, one with labels bearing the “100 gr” indications and one with “per portion”. Subsequently, every participant was interviewed in order to evaluate knowledge on nutrition and healthy lifestyle, use and comprehension of labels and correct interpretation of given portions. **Results:** 114 subjects were equally divided in 2 settings. When considering total Kcals of prepared meals after the simulation, an increase of calories was recorded in the group of subjects who prepared foods bearing the 100g label, although not statistically significant (p = 0.842). In the 100 gr group, outliers with unusually high (or low) observed values were documented. In the subsample that stated to not usually read nutrition information, a statistically significant difference was registered when evaluating both preparation (p = 0.039).

**Conclusions:** Portion size use seemed to be a more intuitive way to properly share nutritional information on food label, especially when considering common traditional recipes. Meals’ responsible appeared to be much more at ease with per portion labeling, when preparing both children’s meals and adult ones.

**T-366-P**

**The Potential Role of Neighorhoods and Schools in Improving Childhood Obesity**

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**Background:** Childhood obesity is a large problem without proven scalable solutions. An increasingly common approach leverages public policy to shape environments in which children spend most of their time: neighborhoods and schools. We estimate the potential for these approaches to improve population childhood obesity rates in a large urban area. **Methods:** We analyze administrative data, including BMI from annual FITNESSGRAM reports, for New York City public elementary and middle school children from 2008-2010. We examine how the incidence of obesity varies by neighborhood and school and estimate the extent to which this variation is explained by student characteristics. We simulate population level changes in obesity arising if students in high obesity neighborhoods/schools matched the obesity rates of neighborhoods/schools with lower obesity rates. **Results:** Among 1,488,877 student-year observations 27.8% were black, 39.1% Hispanic, 85.3% were low-income, and 21.0% were obese. Obesity rates varied widely across schools and neighborhoods, even after adjusting for student characteristics. Using fixed effect regressions, we found the population obesity rate would decrease by 2.4 percentage points, or 11.4%, if above-average obesity neighborhoods/schools had an obesity rate equal to that of the median neighborhood/school. **Conclusions:** There is variation in childhood obesity rates across neighborhoods and schools. If policy interventions successfully decreased obesity in the entire upper half of the distribution of neighborhoods and schools, the change would be welcome but modest relative to the depth of the problem. This highlights the need for deeper approaches incorporating environmental changes while potentially also targeting children and families in different ways.

**T-367-P**

**Parental Concern for Child Body Size: Findings from School-Based BMI Screening Policy**

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**Background:** School body mass index screening (SBMIS) has been recommended by public health leaders as a policy strategy to raise parental awareness of their child’s body size and related health risk. Parents of 12 million public school children in nine states receive SBMIS reports with demonstrated improvements in parental awareness. This suggests progress toward prevention but little is known about parent concern about child body size. Whether parents are concerned about their child’s body size and the factors associated with such concern are unclear. **Methods:** This cross-sectional study examined parent concern about child body size for 1,015 elementary-age children (ages 5-12 years) in 2012. All children were enrolled in Pennsylvania public schools (N = 31) that implemented statewide SBMIS policy. Parents received their child’s objectively measured BMI report from the school approximately 6 weeks before completing the study questionnaire. Linear regression models were used to examine associations of parental concern with child factors (age, gender, child body size) and parent weight perceptions. **Results:** Most respondents were female parent/guardians, 30-49 years of age, and married that described their own weight as “About Right” or “A Little Overweight.” School reports indicate that 16.5% of children were overweight and 18.7% were obese. Parent concern for child body size was significantly associated (all p < 0.001) with child gender, body size, and parent perception of her/his weight but not child age. **Conclusions:** Parent concern was significant for girls and for overweight or obese children overall. Concern for daughters independent of child body size may be unwarranted and potentially harmful. SBMIS should include gender-specific messages and parent education to promote healthy child growth.

**T-368-P**

**Associations between Nutrition Label Use and Added Sugar Intake**

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**Background:** Since the passage of the Nutrition Labeling Education Act of 1990, nutrition labels have provided key information to help consumers make healthier dietary choices. However, there is little research linking regular reading of nutrition labels to actual consumption of added sugars. **Methods:** Using the 2007-2010 National Health and Nutrition Examination Survey Consumer Behavior Module, we included 6,895 adults ages 20 to 65 who responded to the question “How often do you use the Nutrition Facts panel when deciding to buy a food product?” (always/most of the time, sometimes, or never/rarely). We also used 24-hour dietary recall records to estimate grams of added sugar consumed (a proxy for dietary quality). We controlled for age, place of birth, education, use of special diets, income, and weight status. Regression models were run separately for men and women. **Results:** Compared to those who always or most of the time use labels, those who never or rarely do consumed significantly more added sugar (men: +29.8 g; women: +30.1 g; p<.0001), as did those who sometimes do (men: +13.1 g, women: +10.1 g; p<.0001). While label use and level of education were found to be correlated (p<.0001), label use only partially explains the higher added sugar intake among those with a high school or less education. Further, all groups regardless of income and education consume far more added sugar than recommended. **Conclusions:** There appears to be a correlation between nutrition label use and dietary quality. However, the impact of promoting label use warrants more research, especially for the less educated.
T-369-P
Environmental and Policy-Level Support for Healthy Eating, Active Living and Obesity Prevention among Hospital Workers in the Texas Medical Center
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Background: The purpose was to compare and contrast the employee-related wellness policies and practices for obesity prevention among five major hospitals in the Texas Medical Center in Houston, the world's largest medical complex, collectively employing >40,000 employees. Methods: In fall 2012, the NHLBI-validated Environmental Assessment Tool (EAT) survey was used to scan the hospital nutrition and physical activity environment, policies and practices. The scan was conducted by trained independent observers with hospital staff to measure three scales a) organizational characteristics (45 items); b) Food and Nutrition (49 items) and, c) Physical Activity (42 items). Response options were Yes/No and higher scores indicated higher level of support for obesity prevention behaviors. For vending machines, the proportion of healthy beverage or snack item was computed. Results: The mean age of employees across the five hospitals was 39-44 years old, 67%-81% are female, 37%-79% work the day shift and, 54%-82% are in a professional or technical job type. Across the five hospitals, for Organizational Characteristics the score ranged from 45% to 73%; for Physical Activity - 8% to 60%; and for Food and Nutrition - 34% to 62%. None of the hospitals provided managers with performance objectives related to worksite health improvement. The scores for the beverage vending machine environment were poor with average proportion of healthy beverage slots ranging from 0% to 40% across five hospitals. Conclusions: Results showed significant variation across five hospitals and large policy gaps, including lack of policies supporting: a) employee physical fitness, b) healthy catering/meeting policy, c) subsidized healthy food and beverage options in the dining services, d) healthy snack and beverage vending machines, and e) performance objectives related to worksite health improvement.

T-370-P
Pre-School Childcare Staff Knowledge Is Associated with Healthy Nutrition Feeding Practices
Amanda Arguello, Tung Sung Tseng, Ann Clesi, Leslie Lewis, Julia Volufova, Melinda Sothern New Orleans, LA
Background: Positive attitudes and behaviors toward nutrition must be established at an early age; thus, childhood obesity prevention initiatives should begin during the pre-school years. The knowledge and attitudes of pre-school childcare providers may affect the establishment of healthy feeding practices in this setting. Methods: A cross-sectional design was used to determine differences in knowledge, attitudes, and self-efficacy of providers implementing more (N=79) versus less (N=47) healthy nutrition and feeding practices in pre-school childcare centers across Louisiana. Center practices were identified using sixteen selected items of an evaluation tool, Environmental & Policy Assessment & Observation (EPAO), from the Nutrition and Physical Activity Self-Assessment for Child Care (NAPSACC) program. A survey was developed to assess knowledge, attitudes and self-efficacy and was administered to providers in childcare centers. Results: Of 15 participating childcare centers, 8 were identified as centers implementing more and 7 were identified as centers implementing less healthy nutrition and feeding practices. Significant differences were found in knowledge scores (p=0.01) between the two groups. A higher percentage of staff in centers implementing more healthy practices reported that new foods, such as fruits and vegetables, may need to be re-introduced multiple times (98.73% vs. 91.30%; p=0.04), and that it is important to let children recognize hunger in order to learn satiety cues (68.83% vs. 51.11%; p=0.05). Conclusions: Higher knowledge scores were associated with staff in centers implementing more versus less healthy nutrition and feeding practices. These findings support policy that requires nutrition education and training on feeding practices in pre-school childcare settings.

T-371-Pt
Health Literacy, Weight Perception and Calories Purchased among Overweight Fast-Food Consumers in the Bronx, NYC
Nichola J. Davis, Giovanna DiFrancesca, Geordany Gonzalez, Jennifer Lukin, Clyde Schechter Bronx, NY
Background: Fast-food consumption is associated with obesity. Calorie labeling in fast-food restaurants (FFRs) may have little impact on calories purchased. Health literacy, calorie knowledge, and weight perception, may impact how consumers use calorie information. We examined whether health literacy, calorie knowledge, or weight perception were related to calories purchased at FFRs. Methods: Fifty-five overweight participants who go to FFRs at least once per week were recruited from a municipal clinic in the Bronx, to enroll in the C.H.E.K.S (Calorie Health Education Knowledge and Skills) study. At baseline, participants completed measures including calorie knowledge, health literacy measured by Newest Vital Sign (NVS), and weight perception. Calories purchased from FFRs were determined by FF receipts and food logs collected weekly. One-way ANOVA compared baseline variables to calories purchased. Results: Mean (SD) age of participants was 53(23) years. BMI was 34(7) kg/m2. 78% were Black or Hispanic, and 40% had less than HS education. 87% had inadequate HL; 27% correctly identified daily-recommended calories; and 85% considered themselves overweight. Participants with inadequate HL purchased 764(1236); those with adequate HL 470(666) (p=0.54). Participants correctly identifying daily-recommended calories purchased 792 calories vs. 501(920) purchased by those who did not. Participants who considered themselves overweight purchased 650(1154) calories; those who considered themselves the right weight purchased 933(1307) calories (p=0.40). Conclusions: Calorie knowledge, low weight perception, and those who perceive themselves as not overweight may purchase more calories. These factors may be important in interventions to reduce fast-food calories.

T-372-Pt
Health Literacy, Knowledge, Weight Perception and Sugar-Sweetened Beverage (SSB) Purchase among Overweight Fast-Food Consumers in the Bronx, NYC
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Background: SSB consumption is associated with obesity. NYC is debating policies to reduce the size of SSBs sold in fast food restaurants (FFRs). It is unclear whether these policies will work. Additional interventions may be needed to reduce SSB consumption. We examined whether HL, calorie knowledge, or weight perception were related to SSB calories purchased. Methods: Fifty-five overweight participants who go to FFRs at least once per week were recruited from a municipal clinic in the Bronx, to enroll in the C.H.E.K.S (Calorie Health Education Knowledge and Skills) study. At baseline, participants completed measures including calorie knowledge, health literacy measured by the short test of functional health literacy, and weight perception. SSB calories were determined by FF receipts and food logs collected weekly. One-way ANOVA compared baseline variables to calories purchased. Results: Mean (SD) age was 53(23) years. BMI was 34(7) kg/m2. 78% were Black or Hispanic, and 40% had less than HS education. 87% had inadequate HL; 27% correctly identified daily-recommended calories; and 85% considered themselves overweight. Participants with inadequate HL purchased 255(744); marginal HL 25 (58); adequate HL 40(120) (p=0.20). Participants correctly identifying daily-recommended calories purchased 276 calories; those who did not purchased 348 calories (p=0.54). Participants who considered themselves overweight purchased 536(1440) calories; those who considered themselves the right weight purchased 199(568) calories (p=0.09). Conclusions: Calorie and sugar-sweetened beverage purchasing may need to be addressed in interventions to reduce fast-food calories.

T-373-P
Dissatisfaction with Available Treatment Options Underlies Under-Documentation of Obesity by Medical Residents
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Background: The cause of the low rates of obesity documentation and frequent misinterpretation of weight status by medical residents is not known.
Methods: We surveyed all medical residents at this hospital for knowledge, attitudes and documentation behavior about obesity and other issues confronting hospitalized patients. Results: 70 of 146 residents completed the survey (46%). Of these, 98.5% reported obesity to be an important medical issue. 89% correctly identified BMI criteria and 90% correctly identified a class 2 phenotype from a Stunkard drawing; however, 20.3% incorrectly calculated BMI from ht. and wt. in metric units. 75% estimated obesity prevalence among patients as >40% (actual rate 36%), and 60% felt obesity significantly influenced inpatient management in >20% of patients. 94% reported recording obesity in the admission note (actual rate 45%). Similar to diabetes, sleep apnea, homelessness and tobacco use, 75% reported addressing obesity in the assessment/plan if contributing to the reason for admission (actual rate 63%). Compared with smoking cessation, they reported the absence or inaccessibility of programs for specialized post-discharge obesity care as the primary barrier and deterrent to addressing obesity among inpatients.

Conclusions: There was a dichotomy between resident perceptions and behaviors regarding obesity, with limited attention to this disorder despite overestimates of its prevalence and importance to inpatient care and outcomes. Enhanced resident education about medical implications and effective management of obesity, and establishment of more efficient obesity care pathways in the post-acute setting would likely lead to more attention to this problem. Since attitudes and practice patterns are largely determined during residency, promoting greater trainee attention to obesity care will likely generate important long-term benefits.

T-374-P
The Affordable Care Act Impact on Obesity
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Background: The Affordable Care Act (ACA) is the most far-reaching health care legislation since in the enactment of Medicare and Medicaid in the 1960s. The legislation’s principal policy goal is to increase the number of Americans who have access to health insurance. Methods: Analysis and Review of legislation and regulations issued pursuant to ACA. Results: Specific sections of interest regarding the prevention and treatment of obesity will be reviewed. Conclusions: This session with discuss the status of obesity-related issues in the following contexts: Private Insurance Market, elimination of pre-existing condition exclusions, annual and lifetime spending caps, coverage of intensive behavioral counseling of adult obesity, employer wellness programs, and new rights to appeal insurance claims decisions. The Medicaid program, including preventive services, behavioral counseling, and future coverage of drugs for the treatment of obesity. New structures including State health insurance exchanges, the definition of “essential health benefits”. New models of health care systems, such as Accountable Care Organizations, medical homes, and bundled payments. A major research initiative of the ACA is the Patient Centered Outcomes Research Institute (PCORI). The mission of PCORI is to “identify national priorities for research, taking into account factors of disease incidence, prevalence, and burden in the United States (with emphasis on chronic conditions).” The implications of PCORI for research on the prevention and treatment of obesity will be reviewed. Several other provisions of the ACA have implications for obesity prevention. These include the Prevention and Public Health Fund, access to breastfeeding locations by employers, and calorie labeling. The status of these provisions will be reviewed.

T-375-P
Access to Care Barriers for Adolescents Seeking Bariatric Surgery
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Background: The number of severely obese adolescents in the U.S. far exceeds the number who undergo weight loss surgery (WLS). To document the challenges experienced accessing to bariatric surgical care, a retrospective multicenter review was conducted at 5 U.S. centers. Methods: 52 patients (mean age 16 yrs, range 13-19; mean BMI = 53 kg/m2) were included who met established clinical criteria for adolescent WLS between 2009 & 2011. Insurance benefits for WLS were verified to exist for all. Programs complied with insurance policy criteria for WLS authorization, typically including a 6 month period of medically supervised weight loss prior to request for WLS authorization. Patients who voluntarily withdrew or were self-pay were excluded. Results: Patients were predominantly female (79%), Caucasian (71%) with public insurance coverage (52%). Of initial requests for WLS authorization, 52% were approved. No significant differences in initial approval/denial were found by payer. Median time to decision for those who were initially approved was 18 days. Reasons for initial denial included: age <18 yrs (60%), procedure requested (28%), inadequate medically supervised wt loss (4%), lack of medical necessity (4%), psychological concerns (4%). Of those initially denied, 64% (16) were approved through appeal: 1 appeal (11 approvals of 20 who appealed), 2 appeals (2 of 7), 3 appeals (2 of 5), 4 appeals (1 of 2), 5 appeals (0 of 1). Eventually, 83% received insurance approval. Conclusions: Insurance authorization for adolescent WLS is frequently denied despite families having insurance policies with WLS benefits & meeting established clinical criteria for WLS. Initial denials should be appealed, as appeals are often approved. Awareness of frequency of denials may help set expectations for families until evidence-based changes to coverage guidelines improve access to care.

T-376-P
Assessment of Successful Implementation of Risk Management Program to Assure Safe Use of Gymsynia® (Phentermine and Topiramate Extended-Release) Capsules CIV
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Background: Phentermine and topiramate extended-release (PHEN/TPM ER) was one of two new weight loss agents approved in 2012 and was shown to be well-tolerated and efficacious in clinical trials. Because of increased risk of cleft lip/cleft palate seen in pregnant women taking topiramate for migraine prevention or epilepsy, the FDA required a risk evaluation and mitigation strategy (REMS) at approval. Methods: A REMS was developed and implemented to inform prescribers and women of reproductive potential about this risk and consists of risk communication letters to health care providers (HCPs) and medical societies, a voluntary HCP training program, and pharmacy certification. Certified pharmacies ensure each prescription is dispensed with the Medication Guide and patient brochure, and information is collected to identify prescribers who have not completed training. This program was assessed initially at 6 months post-approval. Results: The Dear HCP Letter was sent to over 110,000 clinicians, Twenty-one medical societies were contacted to disseminate the Dear HCP Letter to their members; 29% participated. At week 10 post product launch, more than 5100 clinicians had prescribed PHEN/TPM ER. During this period, 793 prescribers and almost 2200 non-prescribers completed training, and more than 9000 unique patients were dispensed PHEN/TPM ER. The average patient was 51 years old; 24% were male. Primary care physicians (MD/DDs) accounted for 68% of prescribers. All prescriptions were dispensed according to the REMS requirements. Conclusions: During the immediate post-approval period, an educationally-focused REMS program aimed at assuring appropriate use by HCPs and patients was successfully implemented.

T-377-P
Patient Satisfaction of Bariatric Surgery in Mississippi Pilot Project
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Background: The State of Mississippi passed legislation which funded bariatric surgery for state employees in a pilot project. Methods: This prospective, observational, longitudinal study was conducted at the three accredited Bariatric Surgery Centers of Excellence in Mississippi. The surgical procedure performed was based on patient and surgeon choice. Patients were surveyed on their satisfaction with surgery and weight loss. Wilcoxon Signed Rank Test was used to compare satisfaction among those with 6 and 12 month results. The study was approved by the University of Mississippi IRB. Results: Of those responding, at 6 months, 67 of 68 would choose their surgery again and 67 of 69 would recommend their surgery to others. At 12 months, 74 of 77 would choose their surgery again and 75 of 78 would recommend their surgery to others. Using a visual analog scale, with 0 indicating not satisfied at all and 10 indicating very satisfied, the median response for satisfaction with amount of weight loss was 8 at 6 and 12 months, satisfaction with speed of weight loss was 7 at 6 months and 8 at 12 months, and satisfaction with type of surgery was 10 at 6 and 12 months. Among those with responses at 6 and 12 months, the improvement rate was 0.41 (p value 0.041). The mean response for type of surgery was...
T-378-P
Caloric Impact of Substituting Healthier Side Dishes and Beverages for Traditional Options on Children’s Menus
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Background: Frequenting quick service restaurants (QSRs) contributes to children’s consumption of excess calories. Offering healthier sides and beverages by default may reduce the energy density of kids’ meals. Methods: Menus and nutrition information for the top 10 QSR chains with a children’s menu and at least one side dish were collected in Spring 2013. Children’s menus were coded to identify the availability of non-fried fruit and vegetable (FV) side dishes, low-fat (LF) or non-fat (NF) milk and water, and whether these were offered by default. The availability of other sides and beverages was also coded. We estimated the caloric impacts of substituting 1) the most commonly offered FV side for the most commonly offered non-FV side; 2) plain LF or NF milk or water for the most commonly offered sugar-sweetened beverage (SSB); and 3) both 1 and 2, at QSRs where these substitutions would be possible, given current menus. Results: Although 90% of QSRs offered FV sides, only 40% did so by default, and just 1 QSR offered a vegetable. The most commonly offered sides were apple slices (n=7, 48±32 kcal) and French fries (n=7, 220±36 kcal). LF or NF milk and SSBs were available at 90% of QSRs, but only 50% of QSRs offered milk and water by default at 1 QSR, and an SSB was the default at 1 QSR. The most widely available SSB was cola (n=7, 145±36 kcal). Across QSRs, substitutions consistently reduced calories. On average, apples for fries reduced calories by 147±51 (n=3); plain LF or NF milk for cola reduced by 42±39 kcal (n=7); and water for cola reduced by 145±33 kcal (n=4). Substituting both the beverage and side reduced calories by 178±64 for milk (n=5) and 298±55 for water (n=4). Conclusions: Few QSRs offer FV sides, plain low-fat or non-fat milk, or water by default, yet these options consistently reduce total calories in kids’ meals.

T-379-P
Physical Activity Design Guidelines for School Architecture
Jerri Brittin, Leah Frenschi Omaxa, NE; Dina Sorensen, Matthew Trowbridge, Stephen Davis, Joe Celentano, Kelly Callahan Charlotteville, VA; Terry Huang Omaxa, NE

Background: Increasing children’s physical activity (PA) at school is a national focus to address childhood obesity. Aspects of school environment have been shown to affect students’ PA, but a synthesis of best evidence is needed to guide school design practice and to identify pertinent research opportunities. This paper describes the development and application of Physical Activity Design Guidelines for School Architecture. The aim is to provide architecture and public health new insights and strategies for making school environments conducive to healthy physical activity. Methods: We engaged in a collaborative, transdisciplinary qualitative review process with leading architecture experts to develop evidence-based, theory-driven school design guidelines that promote increased PA among students. We addressed the design process, evaluation strategies for impact on institutional and individual outcomes, and application to a particular school test case. Results: The design guidelines include specific strategies in school domains including Active Classrooms, Navigation Areas and Stairs, Fitness Facilities, Technology Environment, Outdoor Spaces, Furniture, Signage, and Community Integration. Driving principles include designing for active lifestyle and routine, and applying theory- and evidence-based behavioral science practice to enable the school community to engage in higher levels of physical activity. We examine the specific application of the guidelines to an elementary school project in Virginia. Conclusions: Implementation of the guidelines is expected to enable students to adopt healthier physical activity practices. Our results have broad implications in setting new industry and education standards, such as partnership with the U.S. Green Building Council toward translation of the guidelines to LEED innovation credits for school building projects.

T-380-P
Texas CORD: Engagement of Healthcare Offices to Address Childhood Obesity in Low-Income Neighborhoods
Sarah E. Barlow, Nancy F. Butte Houston, TX; Deanna M. Hoelscher Portland, ME; Ellie M. Taveras Boston, MA; Stephen J. Pont Austin, TX

Background: The Centers for Disease Control and Prevention’s Childhood Obesity Research Demonstration (CORD) projects identify primary healthcare as a priority in the multisystem, multilevel approach to obesity in Medi-icaid-eligible children aged 2-12 years. The Texas CORD project has implemented system support in multiple health systems. Methods: Non-academic pediatric practices in low-income, diverse neighborhoods were recruited to implement electronic health record (EHR) changes that alert providers to overweight/obese status and embed provider cues regarding assessment and intervention. Obesity behavior change counseling materials (Next Steps) in English and Spanish were provided for use during clinic encounters. A self-paced Next Steps booklet for family use was also developed. Providers received 2-hour training on EHR changes, Next Steps, and motivational interviewing techniques presented in live, teleconference, and video format. Office staff participated in shorter training. Self-administered questionnaires assessed baseline knowledge, self-efficacy and obesity care practices. Office environment was assessed. Results: All practices (n=12) and providers (n=43) approached joined the CORD project. Each healthcare system provided in-kind support for changes in their EHR systems ( Epic, NextGen and E-Clinical Works). All providers and 80% of office staff completed baseline questionnaire and orientation. Completion of office environment assessment was 100%. The healthcare systems will provide aggregate, anonymous reports from EHR of changes in counseling documentation through the roll-out period 2012-2014 Conclusions: The successful engagement of pediatric primary care practices and their parent organizations suggest that EHR changes and counseling materials for childhood obesity are readily scalable and could be implemented in practices across the US.
Gastric Bypass

T-383-P
Iron Deficiency in Preoperative of Bariatric Surgery; Diagnosis, Treatment
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Background: Significant percentage of morbidly obese patients present iron deficiency (ID). Intravenous iron supplementation in preoperative period for patients with iron deficiency is effective in preventing hematocrit decrease. Methods: Observational prospective Study that included 89 morbidly obese patients submitted to bariatric surgery. Population was divided in the preoperative period (pre OP) according to ID condition or absence of it and the postoperative evolution was analyzed (post OP). ID Patients were supplemented with ferric carboxymaltose 500mg intravenous (IV) and evaluated in post OP. Results: 23 patients (25.8%) presented ID in pre OP, 6 (67.4%) anemia. 66 patients (74.2%) did not present ID. The group without ID 1 month post OP presented: Hematocrit: 41.30% ± 3.77; Hemoglobin: 13.64 g/l ± 1.25 and Trasferrin Saturation 30.55 %. Patients with ID in pre OP presented: Hematocrit: 40.40% ± 3.03; Hemoglobin: 13.40 g/l ± 1.07; Trasferrin Saturation: 15.50% ± 4.18 and Ferritin: 87.10 ng/ml ± 81.23. In post OP it was observed Hematocrit decrease 38.40% ± 3.17 (p=0.034). ID Patients, without IV iron supplementation (n=15), Hematocrit and Hemoglobin were of 41.2% ± 2.5 and 13.7 g/l ± 0.9 respectively, with decrease in post OP (37.5% ±3.4 and 12.3 g/l ±0.05). IV iron supplementation in ID patients (n=9), increased Hemoglobin (13.5 g/l ± 0.7) with respect to pre OP (12.8 g/l ± 2; p=0.05), as well as transferrin saturation and ferritin. After 1 month post OP Hematocrit did not have significant changes (Hematocrit pre OP: 39%; Hematocrit post OP: 40%; p=0.05). Conclusions: 26% of the patients present ID in pre OP. Treatment with IV iron seems to be effective in preventing Hematocrit decrease and improving iron metabolism in ID patients in pre OP.

T-384-P
Effect of Bariatric Surgery on Subclincal Thyroid States
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Background: The effect of bariatric surgery on subclincal thyroid states is unclear. This study aims to assess the prevalence of subclinical thyroid states in a group of predominantly Hispanic and African American (AA) bariatric patients and changes after surgery. Methods: Retrospective study of bariatric patients at a New York City hospital. Serum TSH, free thyroxine (FT4), free triiodothyronine (FT3) and body mass index (BMI) were analyzed. Inclusions: patients with BMI and TFT data. Exclusions: known thyroid disease, on thyroid meds, overt thyroid disease on pre-op labs. Normal TSH: 0.35-4.80 μIU/ml. Data presented as mean ± SE. Comparisons made with t-tests, associations with Pearson’s correlations. Results: 549 patients: 72% white Hispanic, 23% AA; 91% females; mean age 39.8 ± 0.5 yrs (18-72); baseline BMI 47.7 ± 0.3 kg/m² (35-88). TSH and BMI correlated in euthyroid patients (r=0.13, p=0.002). Subclinical hypothyroidism: in 1.8% (n=10), mean TSH 6.07 ± 0.4 μIU/ml (none w/TSH >10), FT4: 1.17 ± 0.1 ng/dl, FT3: 2.89 ± 0.1 pg/ml, mean BMI 50.7 ± 4.8 kg/m² (no sig diff c/w euthyroid). Subclinical hyperthyroidism: in 0.7% (n=4), mean TSH 0.16 ± 0.1 μIU/ml (3 w/TSH <0.1), FT4: 1.95 ± 0.1 ng/dl, FT3: 2.62 ± 0.4 μIU/ml, mean BMI 43.1 ± 1.2 kg/m² (no sig diff c/w euthyroid). Of patients with pre-op subclinical disease, 7 of 14 had post-op data and 100% of these were euthyroid, at a mean follow-up of 1.32 ± 0.2 yrs, with a loss of 23.3 ± 2.0% total body weight (57% excess weight loss). Conclusions: We noted marked improvements in subclinical thyroid states after bariatric surgery; whether this represents the natural history of subclinical thyroid disease vs. a surgical effect is unclear. Whether different treatment guidelines should be applied to subclinical thyroid states in pre-op bariatric patients remains unclear. This study’s retrospective nature is a limitation.

T-385-P
Effect of Bariatric Surgery on Systemic and Adipose Tissue Inflammation
Camille Blakewide, Valerie Sams Knoxville, TN; Nalin Suriwardhana Lubbock, TX; Patrick B. Barlow, Matthew L. Mancini, Gregory Mancini Knoxville, TN; Nama Moustaiz-Mousa Lubbock, TX

Background: Bariatric surgery has shown promising benefits in decreasing and/or reversing metabolic disorders such as diabetes and cardiovascular disease. We hypothesized that adipose and systemic inflammation will be decreased post bariatric surgery. Methods: We prospectively enrolled patients undergoing Roux En Y gastric bypass (RYGB) and laparoscopic gastric band placement, collected serum and adipose tissue samples, and measured cytokine levels at the time of surgery, 2 weeks, and 6 months postoperatively. Preliminary data are presented for the first 8 RYGB subjects completed to date. Patient age, gender, presence of diabetes, and hypertension were reported. Results: We found a statistically significant change in the mean adipose tissue adiponectin values over time (p=0.001). There was a statistically significant increase in tissue levels of adiponectin from the day of surgery to both two week and 6 month follow-up (p=0.004 and p=0.007 respectively). We observed an initial decrease in serum adiponectin from time of surgery to two weeks and a slight increase from 2 weeks to 6 months postoperatively. The mean serum MCP1 value was significantly reduced from the day of surgery and/or reversing metabolic disorders such as diabetes and cardiovascular disease. We hypothesized that adipose and systemic inflammation will be decreased post bariatric surgery. Methods: We prospectively enrolled patients undergoing Roux En Y gastric bypass (RYGB) and laparoscopic gastric band placement, collected serum and adipose tissue samples, and measured cytokine levels at the time of surgery, 2 weeks, and 6 months postoperatively. Preliminary data are presented for the first 8 RYGB subjects completed to date. Patient age, gender, presence of diabetes, and hypertension were reported. Results: We found a statistically significant change in the mean adipose tissue adiponectin values over time (p=0.001). There was a statistically significant increase in tissue levels of adiponectin from the day of surgery to both two week and 6 month follow-up (p=0.004 and p=0.007 respectively). We observed an initial decrease in serum adiponectin from time of surgery to two weeks and a slight increase from 2 weeks to 6 months postoperatively. The mean serum MCP1 value was significantly reduced from the day of surgery and/or reversing metabolic disorders such as diabetes and cardiovascular disease. We hypothesized that adipose and systemic inflammation will be decreased post bariatric surgery. Methods: We prospectively enrolled patients undergoing Roux En Y gastric bypass (RYGB) and laparoscopic gastric band placement, collected serum and adipose tissue samples, and measured cytokine levels at the time of surgery, 2 weeks, and 6 months postoperatively. Preliminary data are presented for the first 8 RYGB subjects completed to date. Patient age, gender, presence of diabetes, and hypertension were reported. Results: We found a statistically significant change in the mean adipose tissue adiponectin values over time (p=0.001). There was a statistically significant increase in tissue levels of adiponectin from the day of surgery to both two week and 6 month follow-up (p=0.004 and p=0.007 respectively). We observed an initial decrease in serum adiponectin from time of surgery to two weeks and a slight increase from 2 weeks to 6 months postoperatively. The mean serum MCP1 value was significantly reduced from the day of surgery and/or reversing metabolic disorders such as diabetes and cardiovascular disease. We hypothesized that adipose and systemic inflammation will be decreased post bariatric surgery. Methods: We prospectively enrolled patients undergoing Roux En Y gastric bypass (RYGB) and laparoscopic gastric band placement, collected serum and adipose tissue samples, and measured cytokine levels at the time of surgery, 2 weeks, and 6 months postoperatively. Premi...
T-386-P
Durability of Improvements in Insulin Sensitivity and Insulin Secretion 2 Years After Gastric Bypass: Results from the Longitudinal Assessment of Bariatric Surgery (LABS) Study
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Background: Patients with type 2 diabetes (T2DM) have impaired islet secretory capacity compared to those without (Controls). We hypothesized that insulin secretory capacity would improve in patients with T2DM after gastric bypass (GBP) but decrease in controls as insulin sensitivity improved with weight loss. Methods: 39 subjects with T2DM and 22 Controls were matched for BMI, sex, and age prior to GBP and underwent a meal test (BoostPlus) before, 6 months, and 24 months for fasting blood work to and to calculate insulin sensitivity (SI), total insulin secretory rate (Φ), and disposition index (DI). Results: At 6 and 24 months, both groups lost weight (BMI’s reduced 23% and 29% for T2DM subjects; 25% and 31% for Controls, respectively). 91% of T2DM subjects were in remission after 2 years. Fasting glucose, insulin, C-peptide, and proinsulin levels were lower at each follow-up visit in both groups (P<0.01 for all). Comparing baseline to 6 and 24 months, SI improved 41% (P=0.016) and 69% (P=0.001) in T2DM, and 47% (P=0.007) but then down to 35% (P=0.09) in Controls. Compared to baseline, after 6 months Φ increased 30% in T2DM subjects (P=0.011), but not Controls. By 24 months, Φ was not different from baseline in either group. Disposition Index (DI) increased in T2DM at both 6 (+55%, P=0.034) and 24 months (+64%, P=0.024), but did not change in Controls. Hepatic extraction index for insulin did not change in either group during follow-up.

Conclusions: Remission of diabetes following GBP is initially (6 months) due to both improvement in Φ and SI. Remission of diabetes after 24 months is primarily due to continued improvements in SI, increasing DI despite a reduction in Φ from 6 to 24 mos. Longer term followup of the LABS diabetes cohort will determine if continued deterioration in Φ occurs predicts re-emergence of T2DM after GBP.

T-387-P
Changes in Gut Hormones in Patients with Type 2 Diabetes Randomized to Roux-en-Y Gastric Bypass or Intensive Lifestyle and Medical Management
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Background: The mechanisms by which Roux-en-Y gastric bypass (RYGB) improves T2DM likely include changes in neurohormonal regulators of energy and glucose homeostasis. This is an ancillary investigation of the Diabetes Beteasure Study (DSS), a multicenter trial of 120 patients with T2DM randomized to lifestyle modification and intensive medical management (LS/IMM) or RYGB with LS/IMM (RYGB). Our objective was to characterize hormone changes associated with glycemic changes in RYGB versus LS/IMM. Methods: Fasting and postprandial blood samples after a standard meal were drawn prior to and 1y after randomization from 34 patients in each group at 2 of 4 study sites. Area under the curve (AUC) from 0-120 minutes was computed. Results: At baseline, pts had mean BMI 35.7 kg/m2 and HbA1c 9.7%. At 1y, there were significant differences between LS/IMM and RYGB in wt loss, 9.2% vs 28.1% (P=0.001), HbA1c, 7.4% vs 6.4% (P=0.0004), and fasting glucose, 151 vs 117 mg/dl (P=0.005), respectively. Insulinogenic index (change in insulin/change in glucose from fasting to 30min) increased in RYGB (0.24 to 0.51; P=0.006) but not LS/IMM (0.30 to 0.35; P=0.04) pts. RYGB pts had a 69% increase in GLP-1 AUC (P=0.001), with no significant change in LS/IMM (P=0.005 between groups). GLP-2 AUC increased 36% (P=0.01) after RYGB, but decreased 22% (P=0.02) after LS/IMM (P=0.001 between groups). GIP AUC decreased 26% after RYGB (P=0.001) but did not change (P=0.50) after LS/IMM (P=0.001 between groups). A significant and similar decrease in fasting glucagon occurred in both groups. Glucagon AUC decrease of 15% was only significant in LS/IMM patients (P=0.02), but the change over time was not different between groups (P=0.39).

Conclusions: There was greater improvement in glycemia and a different pattern of change in gut hormone levels one year after RYGB compared with LS/IMM patients.

T-388-P
Effects of Roux-en-Y Gastric Bypass Versus Gastric Banding on B-Cell Function in Patients with Diabetes at Matched ~10% and ~25% Weight Loss
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Background: It is highly debated if the altered nutrient route after Roux-en-Y gastric bypass (RYGBP) improves type 2 diabetes (DM2) independent of weight loss (WL). Methods: Obese subjects with DM2 were studied pre-surgery (PS) and after RYGBP or gastric banding (GB) (n=6/group) at ~10% and ~25% WL with: 1) a 3h 50g oral glucose tolerance test (OGTT); 2) an isoglycemic IV glucose clamp (iso-IVGC); 3) frequently-sampled IV glucose tolerance test. Calculations: Insulin secretion rate (ISR, pmol/kg/mm), derived from C-peptide deconvolution; β-cell glucose sensitivity (BCGS, pmol/kg/min/mmol) slope of ISR vs. plasma glucose disposition index (DI)=BCGS/HOMA-IR. BCGS and DI are measures of β-cell function.

Means±SD. Results: PS, subjects in the RYGBP and GB groups did not differ in age, DM2 duration and control, weight, BMI, ISR or β-cell function. After matched WL (9.3±1.4 vs. 10.3±2.3%; 27.5±3.0 vs. 25.8±2.7%, p=NS), a similar improvement in insulin sensitivity and a small, comparable increase in ISR and β-cell function, during the iso-IVGC, was observed in both groups. In contrast, after oral glucose there was a significantly greater improvement in β-cell function after RYGBP vs. GB at 10% WL (BCGS: p=0.37; DI: 0.28±0.14 vs. 0.03±0.14, p=0.05), that persisted at 25% WL (BCGS: p=0.28; DI: 0.75±0.38 vs. 0.53±0.48, p=0.39), albeit not significantly. Data from the GB group will be presented. Conclusions: After matched 10% and 25% WL, RYGBP and GB led to comparable improvements in insulin sensitivity. After weight loss, improvement in β-cell function during the iso-IVGC was small but similar between surgical groups, while improvement during oral glucose stimulation was dramatically greater after RYGBP vs. GB. These data suggest that the altered nutrient route has an independent effect on the improvement in β-cell function after RYGBP.

T-389-P
Roux-en-Y Gastric Bypass and Laparoscopic Gastric Banding Surgeries Affect the Dynamics of Gut Microbial Ecology and Metabolism
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Background: The gut microbiome in obese individuals contains microorganisms that increase the host’s energy extraction. Bariatric surgeries, Roux-en-Y Gastric Bypass (RYGB) and Laparoscopic Gastric Banding (LAGB), change the habitat for the gut microbes and, therefore, the microbiome’s structure and function. The aim of this study was to evaluate changes in the colonic microbiome structure and function after bariatric surgery. Methods: Using pyrosequencing targeting bacterial 16S rDNA, we analyzed the fecal microbiome’s structure in patients that underwent RYGB and LAGB surgeries, as well as normal-weight and obese individuals. To better understand microbiome function and its effect on host metabolism, we measured fecal pH, soluble chemical oxygen demand (SCOD), and short-chain fatty acids (SCFAs). Results: LAGB and RYGB groups had more Proteobacteria (mainly Enterobacteriales) than obese and normal-weight groups, due to the increase in gut bacteria that increase the host’s energy extraction. Bariatric surgeries, Roux-en-Y Gastric Bypass (RYGB) and Laparoscopic Gastric Banding (LAGB), change the microbiome’s structure in patients that underwent RYGB and LAGB surgeries. Prebiota, a carbohydrate-degrading genus, was more abundant in RYGB than in obese and normal-weight groups, due to increasing carbohydrate delivery to the colon after bariatric surgery. Fecal SCOD was the highest in the obese group and descended in the following order: LAGB, RYGB, normal-weight groups. SCFAs, propionate, caproate, and butyrate, were more abundant in obese and unsuccessful bariatric surgery groups than in the successful bariatric surgery and normal-weight groups. Fecal pH was the lowest in the obese group, which can be explained by higher production of fermentation products. Conclusions: Bariatric surgery changes the gut microbiome, favors the presence of Proteobacteria, and shifts the microbiome’s structure towards the microbiome in normal-weight individuals. The abundance of fermentation products seems to correlate with the state of weight-loss and could be key to understanding the pathogenesis of obesity.
**T-390-P**

**GLP-1 Secretory Dynamics in a Man with Colectomy and Ileostomy: Preserved Pulsatile Release at Markedly Higher Circulating Concentrations and Disrupted Coupling with Glucose and Insulin**

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**Background:** Blunted intestinal GLP-1 release with compromised insulin sensitivity has been reported in subjects without a colon. Objectives: To assess GLP-1 secretory properties in a male without colon. **Methods:** Study subject: 71 y/o male with colectomy. Control group: 8 healthy men (age 19-60 yrs). Subjects were studied on 2 occasions after an overnight fast, followed by ingestion of either 75 grams of dextrose solution or water. Sessions started at 0800-0900 hr, and continued for 6.5 hrs. Blood was collected at 10-min intervals for measurement of glucose (mg/dL), insulin (μU/mL), and GLP-1 (pmol/L). Secretory pattern of GLP-1 was assessed by deconvolution analysis. ApEn and cross-correlation analyses were used to assess pulse regularity and correlations among glucose, GLP-1, and insulin. **Results:** Subject with colectomy had 1) markedly elevated mean 1.5 hr GLP-1 concentration on control (17.5±4.0 v 2.6±0.2; P<0.0001) and dextrose (19.2±0.3 v 1.0±0.1; P<0.0001) days; (2) blunted response to dextrose intake (8% v 288%); (3) comparable glucose (98±3 v 98±4; NS) and insulin (20±4 v 29±5; NS) responses to dextrose ingestion; (4) preserved pulsatile GLP-1 release with 85±25 (control/dextrose) fold increases in total GLP-1 secretion due to augmented basal and pulsatile release; (5) delayed cross-correlation of GLP-1 with glucose (70 v 10 min lag), and obliterated insulin/GLP-1 coupling. **Conclusions:** Pulsatile release of GLP-1 in a subject with colectomy is characterized by increased secretory rate, but unchanged glucose/insulin homeostasis regardless of blunted GLP-1 response to dextrose ingestion and disrupted cross-correlation among glucose, GLP-1, and insulin.

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**T-391-P**

**Overnutrition Stimulates Intestinal Epithelium Proliferation Through β-Catenin Signaling in Obese Mice**

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**Background:** Obesity is a major risk factor for type 2 diabetes and cardiovascular diseases. And overnutrition is a leading cause of obesity. After they are ingested, most nutrients are absorbed in the small intestine. Signals from β-catenin are essential to maintain development of the small intestine and homeostasis. **Methods:** In this study, we employed a hyperphagia db/db obese mouse model and a high fat diet induced obese mouse model to investigate the effects of overnutrition on intestinal function and β-catenin signaling. **Results:** The β-catenin protein was upregulated along with inactivation of glycogen synthase kinase-3 (GSK-3) in the intestines of both db/db and HFD mice. Proliferation of intestinal epithelial stem cells, villi length, nutrient absorption and body weight also increased in both models. These changes were reversed by caloric restriction in db/db mice and by β-catenin inhibitor JW55 (a small molecule that increase β-catenin degradation) in HFD mice. Parallel, in vitro experiments showed that β-catenin accumulation and cell proliferation stimulated by glucose were blocked by the β-catenin inhibitor FH535. And the GSK-3 inhibitor CHIR98014 in an intestinal epithelial cell line increased β-catenin accumulation and Cyclin D1 expression. **Conclusions:** These results suggested that, besides contribution to intestinal development and homeostasis, GSK-3β/β-catenin signaling plays a central role in intestinal morphological and functional changes in response to overnutrition. Manipulating the GSK-3β/β-catenin signaling pathway in intestinal epithelium might become a therapeutic intervention for obesity induced by overnutrition.

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**T-392-P**

**GLP-1 Improves Endothelial Dysfunction After Roux-en-Y Gastric Bypass Independently from Body Weight Loss**

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**Background:** The mechanisms of cardiovascular protection after RYGB are still unclear but seem partly weight-independent. Insulin and GLP-1 have endothelial protective actions through endothelial-NOS-synthese (eNOS) activation. Here, we investigated the role of insulin and GLP-1 in obesity-induced endothelial dysfunction in rats after RYGB, prior to significant weight loss. **Methods:** Male Wistar rats were exposed for 7 weeks to a high-fat high-cholesterol diet and were RYGB or sham operated. Sham rats were fed ad lib (AL) or body weight-matched (BMW) to RYGB; part of RYGB rats received exendin-9 chronically after surgery. Aortic rings were collected 8 days post-surgery and suspended for isometric tension recordings. Cumulative relaxation responses were performed to insulin and GLP-1 after contraction with norepinephrine. Western blotting of aortic lysates for the GLP-1 receptor and eNOS was performed to address the role of GLP-1 signaling in endothelial function. **Results:** GLP-1 plasma levels were measured. **Results:** On day 8 post-surgery, the weight difference among the 3 groups was not yet significant; plasma fasting levels of GLP-1 were increased after RYGB compared to sham AL and BMW. Insulin and GLP-1-induced vasorelaxation was improved in RYGB compared to sham AL and BMW rats; the improvement of insulin-induced vasorelaxation was absent in RYGB rats after chronic exendin-9 treatment. In vitro, the eNOS blocker L-NAME inhibited insulin- and GLP-1-induced vasodilatation, and exendin-9 blocked the effect of GLP-1. GLP-1 receptor protein expression was lower in aortic lysates from sham AL and BMW compared to RYGB; eNOS expression was also reduced. **Conclusions:** Our study suggests that GLP-1 may be a crucial mediator of the cardiovascular protective effects of RYGB and the early improvement of vasorelaxation induced by insulin or GLP-1.
were gut-function related. One of these 4 genes was potentially related to gut-peptide function; the monovalent cation-specific transient receptor potential channel type M5 (TRPM5) was down-regulated 2-fold. Interestingly, gutTRPM5 is up-regulated in gastric mucosa of obese humans and may influence ghrelin and CCK secretion. We also found 24 different gene-expression significances between GB-0 and GB-E2 rats: 5 in cell-function genes, 2 transcription factors, 6 immune-related, and 4 gut-function related genes, however none of which seemed related to gut-peptide function. Conclusions: We conclude that Affymetrix analysis may provide valuable clues for understanding the therapeutic and side effects of GB.

**T-395-P**

**Insights Into Underlying Mechanism and Improved Efficacy of the Adjustable Gastric Band**

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**Background:** Currently, bariatric surgery remains the only effective treatment for morbid obesity. Laparoscopic adjustable gastric banding (LAGB) is one of the most commonly performed bariatric procedures. The mechanism(s) underlying its efficacy are unclear. This study aims to elucidate the role of sensory neural pathways in mediating AGB-induced satiety in a rodent model and assess the effectiveness of adjuvant therapies on AGB-induced weight loss.

**Methods:** Adult male Sprague Dawley rats (n=8/group) were fitted with an AGB, just below the gastro-oesophageal junction. To determine the importance of vagal sensory afferents in neural activation following gastric band inflation, capsacain was used to ablate unmyelinated c-fibres. Biotelemetry devices implanted between the inter-scapular lobes of brown adipose tissue (BAT) were used to assess the impact of AGB on energy expenditure in BAT. Pharmacological agents (thyroxine and Contrace) were used to assess the impact of thyroid hormone on energy expenditure.

**Results:** The resultant average body weight for the rats was observed for DR as compared to the Sham. NMR analysis of body composition showed that weight loss will be greatest for the rats with VSG, followed by VSG components - the complete removal of the proximal part (proximal resection-PR) and the partial removal of the distal part (distal resection-DR) along the greater curvature. Rapid gastric emptying seen after VSG may play a role in weight loss. Since the proximal part of the stomach expands upon arrival of food and prevents rapid gastric emptying, we predicted that PR will play an important role in weight loss following VSG. Our hypothesis was that weight loss will be greatest for the rats with VSG, followed by VSG components PR and DR respectively as compared to sham operated rats (Sham). Methods: Two cohorts of male Long Evans rats, LF on regular chow and HF on high fat diet, were operated for VSG, PR, DR, and Sham (n=6 for LF and n=10 for HF in each surgical group). Results: The resultant average body weight for PR was significantly lower than Sham but higher than VSG. No weight loss was observed for DR as compared to the Sham. NMR analysis of body composition showed the difference in total body weights was due to the difference in body fat. Gastric emptying analysis with both the oral acetaminophen test as well as the planar gamma imaging study showed significantly higher gastric emptying rates for PR and VSG as compared to Sham and DR.

**Conclusions:** Thus, the study presents strong evidence for the role of rapid gastric emptying in weight loss following VSG.

**T-397-P**

**Endocrine Responses to Gastric Bypass Surgery in Diet Induced Obese Rhesus Macaques**

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**Background:** Roux-en-Y gastric bypass (RYGB) surgery is an effective and durable treatment for obesity and improves the majority of its comorbidities such as diabetes, hypertension and hyperlipidemia. This study establishes a model of RYGB in diet-induced obese Rhesus Macaques. Methods: Twenty obese animals were selected (14 males and 6 females) of which 13 were insulin resistant and 7 required insulin treatment to manage diabetes. In the first phase, animals were food restricted to determine the effects of caloric restriction. In the 2nd phase, after regaining body weight, animals were divided into a group receiving RYGB procedures; however all receiving a sham surgery and pair fed to the RYGB group (SHAM/PF). Results: After 12 weeks of caloric restriction, we observed 12% weight loss. This improved glucose homeostasis and insulin resistance, however diabetic animals still required insulin therapy. Energy expenditure was proportionally reduced in response to the weight loss as measured by indirect calorimetry. After surgery, food intake was reduced by 80% in the first 2 weeks but returned to pre-surgery levels at week 12. Sham/PF animals lost 13% of their body weight compared to 24% in the RYGB group. Animals had a greater improvement in HOMA-IR and fasting insulin levels following RYGB compared to SHAM/PF or diet restriction alone. Surprisingly, both SHAM/PF and RYGB had similar improvements in glucose stimulated insulin secretion. Consistent with this, there were no changes in islet morphology, size distribution or proliferation. Interestingly, during this 12-week study, RYGB as well as SHAM/PF diabetic animals were able to maintain normal glucose levels without insulin. Conclusions: This study demonstrates that RYGB in NHP improves glucose tolerance, but that the caloric restriction following surgery could contribute to the initial improvement in glucose homeostasis.

**Thursday, November 14, 2013**

**Poster Presentations**

**GI Hormones, Satiety, and Microbiome**

**T-398-P**

**Changes in Pancreatic Polypeptide Responses to a Solid Meal Test Differ During the First Year After Laparoscopic Gastric Bypass vs. Adjustable Gastric Banding**

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**Background:** Animal models implicate a role for vagal nutrient sensing in metabolic changes after gastric bypass (GBP). Pancreatic polypeptide (PP) is considered a plasma marker of pancreatic efferent vagus nerve (VN) activity in humans. Methods: We compared plasma PP responses during and 3h after a solid meal test (MT) in obese, healthy patients (38±4yr) having GBP (9F) with preservation of the VN or adjustable gastric banding (AGB, SF/1M) before (PRE), and ~2 months (2MO) and 1 year (1YR) after surgery. Concurrent changes in weight (WT), fat (FM) or fat-free mass (FFM) (DXA) and plasma fasting, peak and max meal responses (MAX=peak-fast) of PP, insulin and aGLP-1 were compared between and within groups by Student’s and paired t tests; effects of surgery (TX) and changes in WT, FM or FFM on PP MT response curves were assessed using mixed model ANOVA for repeat measures. Results: All PRE-op PP measures were similar for GBP and AGB and inversely related to WT, FM and FFM. By 2MO, PP peak levels and MAX response were lower post-GBP (p=0.003); in mixed models, TX and WT or FM or FFM losses were independent factors for a lower response (all p<0.001). PP responses were unchanged after AGB at 2MO. MAX PP responses were associated with MAX aGLP-1 in GBP (r=0.68; p=0.05) and AGB (r=0.95; p=0.004). At 1YR, PP responses in GBP were not different from PRE-op. Conclusions: Changes in PP responses to a solid meal test differ during the first year after GBP vs. AGB.
from PRE levels, but associated with WT (p=0.03) or FM (p=0.05) loss. In AGB, PP response patterns were greater than PRE levels with both TX (p=0.001) and FM loss (p=0.04) as independent factors; MT peak and MAX PP were associated with insulin peak (r=0.91; p=0.01) and MAX (r=0.97; p=0.001). Conclusions: GBP results in a relative transient decrease in PP response to a solid MT, while PP responses increased following AGB in the longer term indicating differing effects of these procedures on VN effferent signaling.

T-399-P
Satiety Responses to High-Fat Meals of Varying Fatty Acid Composition in Obese Women
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Background: To determine the response of the satiety hormone, peptide YY (PYY), and subjective feelings of hunger and fullness after high-fat (HF) meals rich in either monounsaturated (MUFA)s, polyunsaturated (PUFA)s, or saturated fatty acids (SFA)s. Methods: This single-blind crossover study was designed to test three HF meal (70% of energy) conditions rich in MUFA-s, PUFA-s, or SFA-s. Twelve obese women, baseline. Each of the three meals (HF average for PUFA: 46.6 ± 7.4mm, SFA: ± 17.0 ± 4.3pg/mL, MUFA: ± 19.9 ± 9.2pg/mL) were consumed during the buffet-style meal between the visits. Differences in the amount of energy consumed or type of macronutrients thought they could eat were found between the meals. There were no 7.7mm, p<0.01, respectively. No differences in hunger or how much consumption were measured. A buffet-style lunch was provided 5h after the HF meal and macronutrient and total energy were measured. Results: The PYY response to the PUFA-rich meal was significantly higher (p<0.001), than the MUFA- or SFA-rich meals (mean change in PP PYY for PUFA: 28.0±4.3pg/mL, MUFA: 17.0±3.4pg/mL, and SFA: 12.6±6.9pg/mL). The PUFA-rich meal also elicited the greatest fullness of compared to MUFA- and SFA-rich meals (PP average for MUFA: 46.6±8.4nm, MUFA: 40.46±7.4nm, SFA: 40.6±7.7mm, p<0.01, respectively). No differences in hunger or how much they thought they could eat were found between the meals. There were no differences in the amount of energy consumed or type of macronutrients consumed during the buffet-style meal between the visits. Conclusions: HF meals rich in PUFA-s elicited the greatest PYY response versus meals rich in MUFA-s or SFA-s in obese women.

T-400-P
Effects of Acute and Longer-Term Dietary Restriction on Upper Gut Motility, Hormone, Appetite and Energy Intake Responses to Duodenal Lipid in Lean and Obese Males
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Background: 4-day 70% energy restriction enhances gastrointestinal (GI) sensitivity to nutrients, associated with enhanced energy intake-suppression by lipid. Whether these changes occur with 30% energy restriction and are sustained in the longer-term is unknown. We hypothesized that: i) in lean and obese, 4-day 30% energy restriction would enhance the effects of intraduodenal lipid on GI motility, gut hormones, appetite/intake, and ii) in obese, 12-week energy restriction associated with weight loss would diminish the effects of acute energy restriction on the responses to intraduodenal lipid. Methods: 12 obese males were studied before, and after four days (“day-5”), four (“week-4”) and 12 weeks (“week-12”), 12 lean males before and after four days, on a 30% energy restricted diet; each time antropyloroduodenal pressures, gut hormones and appetite were measured during a 120-min (2.86 kcal/min) intraduodenal lipid infusion and energy intake at a buffet-lunch. Results: On day-5, fasting cholecystokinin (CCK) was less, and ghrelin increased, in lean (P<0.05), but not obese, and lipid-stimulated CCK and peptide-YY (PYY) and desire-to-eat were greater in both groups (P<0.05), with no difference in energy intake, compared with baseline. In obese, 12-week energy restriction led to weight loss (9.7(0.7) kg). Lipid-induced basal pyloric pressure (BPP), PYY and desire-to-eat were greater (P<0.05), while the amount eaten was less (P<0.05), at week-4 and week-12 compared with baseline. Conclusions: 4-day 30% energy restriction modestly affects the responses to intraduodenal lipid in health and obesity, but not energy intake, while 12-week energy restriction, associated with weight loss, enhances lipid-induced BPP and PYY, and reduces food intake (despite increased desire-to-eat), suggesting that energy restriction increases GI “sensitivity” to lipid.

T-401-P
Correlation of Gut Hormones with Body Composition Characteristics in Obese Children
Peyvand Amini, Farrell Cahill, Danny Wadden, Pardis Pedram, Wayne Gulliver, Edward W. Randell, Tracey Bridger, Hongwei Zhang, Guang Sun St John’s, Canada

Background: Gut hormones and adipokines are important factors in the regulation of energy homeostasis via their orexigenic or anorexigenic effects. However, their role in the regulation of body composition in obese children is still largely unknown. The main objective of this study was to investigate the associations of ghrelin, GLP-1, PYY, leptin and TNF-α with body composition in obese children. Methods: 124 obese children (65 girls, 59 boys) between the ages 6-17 years with BMI ≥ 85th percentile, were enrolled in this study. Gut hormones (ghrelin, GLP-1, PYY), leptin and TNF-α were measured using the magnetic bead-based multiplex kit (Millipore). Body composition measurements were performed using dual-energy X-ray absorptiometry (DXA) in twelve obese women. Results: 124 obese children had significantly higher leptin (p value = 0.002) but lower TNF-α (p value= 0.007) compared to boys. There was a significantly positive correlation between leptin and body fat percentage (BF%) in obese children (r = 0.73, p < 0.001). In the next step subjects were divided in to two groups based on their gender. In boys, leptin was the only hormone that was significantly correlated with the BF% (r = 0.67, p < 0.001). However, in girls a negative correlation between ghrelin and BF% (r = -0.36, p value = 0.02), and a positive correlation between GLP-1 and leptin and BF% (r = 0.28, p value =0.03, and r = 0.74, p value < 0.001 respectively) were revealed. Conclusions: Our results provided further evidence on the role of ghrelin and GLP-1 in the regulation of body composition in obese girls. The gender difference warrants more study.

T-402-P
Gut Hormones and Childhood Obesity in the Newfoundland Population
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Background: The prevalence of childhood obesity has dramatically risen globally and the immediate health effects can include risk factors for cardiovascular disease, diabetes, bone/joint problems, sleep apnea and psychosocial problems. Peripheral signals (hormones) secreted from the gastrointestinal tract (gut) have been suggested to be involved in energy homeostasis in adults, however, whether gut hormones are important in the etiology of childhood obesity is unclear. Our objective was to seek evidence by comparing the concentrations of three functionally related gut hormones, glucagon-like peptide-1 (GLP-1), ghrelin and peptide YY (PYY) between a cohort of obese children and a healthy control group. Methods: Forty-four obese children from our ongoing Newfoundland Childhood Obesity Study were matched by age and gender with seventeen healthy controls from our CODING Study. Anthropometric measures were taken and body composition was assessed using dual-energy X-ray absorptiometry. Serum concentrations of gut hormone GLP-1, ghrelin and PYY were measured with the Luminex MagPlex system utilizing Milliplex magnetic bead assays (multiplexed). T-tests and ANCOVAS were used to compare gut hormones between the matched groups. Results: Student t-test analyses showed that circulating ghrelin and GLP-1 concentrations were lower in the childhood obese group as compared to the control cohort (ghrelin: P<0.040, GLP-1: P<0.001). However no differences existed between the groups for serum PYY concentration (P=0.503). When an ANCOVA was performed controlling for age, the significance became borderline for ghrelin (0.05), but remained significant for GLP-1 (0.004) and unchanged for PYY (0.445). Conclusions: Our research findings emphasized the important role of ghrelin and GLP-1 in childhood obesity in the Newfoundland population.
POSTER ABSTRACTS – WEDNESDAY, NOVEMBER 13 to FRIDAY, NOVEMBER 15, 2013

T-403-P
Significant Association of Dietary Macronutrient Intake with Serum Gastrointestinal Hormones in Obese Children
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Background: Gastrointestinal (gut) hormones play an important role in the regulation of food intake and metabolism. Dysregulation of gut hormones are often seen in obese children. However, there is very little data regarding the effect of macronutrients (fat, protein and carbohydrates) intakes on circulating levels of gut hormones in childhood obesity. Methods: In the present study we investigated the relationship between dietary intake of fat, protein and carbohydrates with fasting serum ghrelin, PYY, GLP-1 and leptin (Luminex MAGPIX platform using multiplex magnetic bead assays) in 100 obese children (6-17yrs with BMI > 90th percentile) recruited from the Newfoundland population. Macronutrient intake was evaluated using the Willet Food Frequency Questionnaire and computed with Nutribase software. Obese children were ranked and divided into tertiles (Low, Medium, High) based upon dietary intake of fat, protein, carbohydrates. One-way analysis of variance was used to assess the association of macronutrient intakes with the four hormones. Results: Obese children with high dietary fat intake had significantly lower levels of PYY (66.27±43.1 vs 42.43±28.19pg/ml, P = 0.029), GLP1 (18.48±9.2 vs 13.61±5.89pg/ml, P = 0.038), and leptin (26.98±14.3 vs 19.67±9.9ng/ml, P = 0.04). Higher circulating levels of ghrelin (19.8±12.9pmol/l vs 38.8±30.8pmol/l, P = 0.049) were found in those with high carbohydrate intake. The dietary intake of protein was not significantly associated or not associated with the four hormones in obese children. Conclusions: In summary, our results provide evidence that lowering dietary fat and carbohydrate intakes may help to normalize circulating gut hormones which are associated with lower body fat.

T-404-P
Association of the Intestinal Microbiome with Obesity and Comorbidities in Children
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Background: Comparison of the intestinal microbiota in normal and obese adults has revealed differences in bacterial composition and diversity. Little is known about the impact of the microbiome on pediatric obesity and its complications. Methods: We analyzed the fecal microbiomes of 11 obese children (mean BMI<50ile 98.51) and 3 normal (mean BMI<50ile 80.33) children. Samples were analyzed using PCR with primers for the 16S rDNA region and analyzed using Nextgen sequencing. Correlations and non-parametric analyses were used; significance p<0.05. Results: We found that bacteria in the Firmicutes phyla are more abundant in normal controls (81%) than obese children (64%). Firmicutes were the dominant phylum in 9 obese patients and all 3 controls. There was a trend toward more Bacterioidetes in obese patients (32% versus 16%). Linear regression shows a trend towards increasing BMI as the ratio of Bacterioidetes increases. (R2 = 0.223) There was a positive correlation between an increasing Firmicutes ratio and vitamin D deficiency (P = 0.01). Higher Firmicutes populations trended towards a higher microbiome diversity (P = 0.15). Children with an increasing Bacteroidetes population trended towards a negative correlation with diversity (P = 0.253). Children with high ALT (NASH) correlated with low diversity (P = 0.05). Conclusions: We found that morbidity obese children may have different microbial profile than non-obese controls, in terms of complexity and diversity.

T-405-P
Serum Acylated Ghrelin Is Negatively Correlated with High Sensitivity C- reactive protein (hs-CRP), one of the most important acute phase reactants involved in the inflammation processes, in a large population based study.

Methods: 2220 subjects from the CODING (Complex Diseases in the Newfoundland population: Environment and Genetics) study were enrolled in our investigation. Serum ghrelin was measured with an ELISA Kit (Sphero-bertin Pharma). hs-CRP was measured by the nephelometric method (Beckman Coulter). Dual energy X-ray absorptiometry (DXA) was performed for the measurement of body composition. Multiple regression analyses were used to explore the potential association between circulating acylated ghrelin and hs-CRP adjusting for body fat, gender, percentage of body fat, physical activity, smoking, alcohol consumption and fasting blood glucose. Results: Multiple regression analyses revealed a significant negative correlation between ghrelin and hs-CRP (unstandardized β = -0.06, p = 0.02). After dividing the subjects into in normal weight, overweight and obese groups, based on the Bray criteria, the correlation remained significant only in normal weight group (unstandardized β = -0.18, p < 0.001). Conclusions: This study suggests that circulating ghrelin is inversely associated with the inflammatory marker CRP, in the general population, and this effect is more evident in normal weight individuals.

T-406-P
Docosahexaenoic Acid (DHA) Attenuates Postprandial Hyperlipidemia by Activating Peroxisome Proliferator-Activated Receptor-Alpha (PPAR-α) in Intestinal Epithelial Cells
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Background: Postprandial hyperlipidemia is a risk of cardiovascular disease. Dietary fat contributes to this condition through the production of chylomicrons in the small intestine. Peroxisome proliferator-activated receptor-α (PPAR-α), which regulates lipid metabolism in peripheral tissues such as the liver, is expressed in intestinal epithelial cells; PPAR-α activation reduces circulating triglyceride (TG) levels. Docosahexaenoic acid (DHA) is a well-known dietary fat that reduces plasma TG levels. However, its effects on intestinal lipid metabolism and postprandial TG response are not fully understood. Therefore, we aimed to explore the effects of DHA on intestinal lipid metabolism and postprandial TG response. Methods: In Caco-2 cells, the effects of DHA treated for 48 hours on mRNA expressions of fatty acid oxidation related genes, the activity of fatty acid oxidation, and TG and apoB secretion were measured. In C57BL/6 mice and PPARα deficient mice, the effects of high fat diet containing DHA rich-fish oil on lipid metabolism in the intestine and the liver and postprandial TG secretion after olive oil administration were analyzed. Results: In Caco-2 cells, DHA increased fatty acid oxidation and reduced TG and apoB secretion. DHA-rich fish oil increased intestinal fatty acid oxidation in and attenuated plasma TG levels by decreasing TG secretion from intestinal epithelial cells after olive oil administration in C57BL/6 mice. Interestingly, these changes were not observed in the liver. Furthermore, the effects of DHA were abolished in PPARα deficient mice. Conclusions: These findings indicate that food-derived compounds such as DHA, which activate PPARα, are promising as regulators of postprandial hyperlipidemia via intestinal fatty acid oxidation.

T-407-P
A Moderate Bile Acid Supplementation in the Diet Induces Some Pathologic Features in Metabolic Syndrome
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Background: It has been reported that oral administration of cholic acid (CA) promotes energy expenditure. The effect should be considered as pharmacological because the CA concentration is extremely high. Bile acid (BA) secretion also increases in diet induced obesity (DIO), but the increase is not so much as compared to that in the CA administration study. To elucidate the involvement of moderately increased BAs would contribute to the development of new therapeutic strategies against MS. Methods: WKAY/Hkm Str male rats were fed an AIN-93-based diet with or without 0.05% cholic acid (CA) for 13 weeks, which would not promote apparent energy expenditure in the adipose tissues. We analyzed blood parameters including cytokines and lipids, BA composition in feces, changes in the gut permeability, and gene expressions in some tissues. Results: Significant increase was observed in serum AST, ALT, and TNFα. The moderate CA supplementation increased secondary BA concentrations in the feces as well as an increase in the gut.
permeability. These are usually observed in DIO. Interestingly, a reduction in the plasma adiponectin was found in the CA group from 3 weeks without weight gain of the adipose tissue. At week 13, IL-10 expression was down-regulated in the mesenteric lymph nodes of the rats fed the CA diet. It is possible that tissues located geometrically close to intestine are relatively sensitive to BA fluctuation in gut contents. Some secondary BAs might be a key molecule to regulate IL-10 in mesenteric lymph nodes and serum and AST/ALT. Conclusions: The moderate CA administration affected the functions in hepatocytes, adipocytes and immune cells. On the other hand, there was no influence in glucose and lipid metabolism. An increase in BAs would induce some pathologic features in MS.

T-408-P
Identification of Unknown Bile Acids in Feces and Intestinal Contents in Rats Fed-High Fat Diet
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Background: Importance of bile acids (BAs) is reported both in beneficial and pathological aspects in diet-induced obesity (DIO). Looking into the composition of BAs, the composition appears diverse depending on the experimental design as well as source of the samples. We have already established a reliable extraction and analytical methods in BAs by using UPLC-MS and applied the method to some experimental studies of DIO. Already known BAs are obviously found in the biological samples, but some unidentified molecules were also found in the intestinal contents in experimental DIO. We have tried to identify some unidentified BAs in the experimental DIO and some other relevant studies. Methods: WKAH/HkmSic male rats (3 weeks old) were fed AIN-93G-based control diet, high-fat diet (high sucrose or dextrin), or control diet supplemented with cholic acid (CA) (0.5 g/kg diet) for over 12 weeks. The CA-supplemented group is designed to mimic a BA increase under DIOs and it has been already confirmed that the supplementation level of CA would not induce apparent energy expenditure. The feces were collected every two weeks during the experiment and analyzed the concentration of each known BAs. The identification of some unknown BAs was done by UPLC-ESI/MS with some appropriate standards. Results: We have detected some conventional BAs such as deoxycholic acid (DCA) and some types of muricholic acids in the feces and intestinal contents. Almost no taurine- or glycin-conjugated BAs was found in the cecum, colon, and feces even in the rats fed high-fat diet. Interestingly, the concentration of 12-oxo-lithocholic acid has increased along that in DCA in all the treatment groups and the amount was much higher than lithocholic acid. Conclusions: Some unidentified BAs might be involved in DIO pathophysiology.

T-409-P
Ingestion of Cholic Acid Modulates the Gut Microbiota and Intestinal Epithelial Proliferation
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Background: Bile acid (BA) increases in the intestinal contents and feces under consumption of high-fat diet and some BAs, such as deoxycholic acid, have strong bactericidal activity. We investigated whether a cholic acid (CA) supplementation in rats influences the intestinal epithelial proliferation and cecal microbiota, as well as the bile acid metabolism and serum biochemical parameters. Methods: WKAH/HkmSic rats (3-week-old, male) were divided into two diet groups, such as control group fed either an AIN-93 based diet or CA (2 g/kg diet)-supplemented control diet for 10 days. The cecal microbiota was determined with 16S rRNA clone library method. We also measured cytokine, IL-10 levels in mesenteric lymph nodes and serum and AST/ALT. Results: There was a significant increase in epithelial proliferation in CA-fed rats even after exposure to the gamma-rays. In the gut microbiota, population of Firmicutes was reduced by 90% in the CA-fed rats. The proliferation of IEC-6 cells was promoted in the culture of BAs. Moreover, the expression of CA-fed rats in the gut microbiota included some promotion factor for the epithelial proliferation. Such increased BA would regulate the gut microbiota as well. Conclusions: These findings support the hypothesis that orosensory stimulation across DIO is higher in the dynamic compared to static phase. However, changes in the orosensory stimulation do not necessarily generalize to increased intake of other palatable stimuli.

T-410-P
Rats Maintained on a High-Energy Diet Show Increased Sham-Feeding Intake to Sucrose Solutions During the Dynamic Compared to Static Phase of DIO
Yada Tresukosol, N-Chu Liang, Timothy Moran, Baltimore, MD

Background: The diet induced obesity (DIO) model involves presentation of a palatable, calorie-dense diet that animals will overeat and consequently gain weight. The model provides an experimental analogy for the overconsumption of high fat/high calorie foods that lead to obesity in humans. We have shown that rats increase meal size upon initial presentation of a high-fat diet. Meal size decreases with continual access. The increase may be attributed to increased orosensory stimulation and/or reduced sensitivity to postingestive inhibitory signals. During feeding both types of signals are simultaneously in play. Methods: Here, sham-feeding (SF) testing was conducted in rats fed a high-energy diet (HE) or 45% high-fat diet (HF) after short (dynamic) and longer (static) periods on the diet and after animals were returned to standard chow. Responses were compared to those of Chow-fed controls (CHOW). The procedure involves allowing the rat to ingest a sucrose solution and then preventing accumulation in the stomach. Thus intake with minimized postingestive feedback can be measured. Results: We hypothesized enhanced orosensory stimulation across DIO elicited by exposure to the calorically-dense diets would generalize to increased intake of other palatable stimuli. Indeed, compared to responses during dynamic testing, HE rats decreased SF intake during the static phase. The HF and CHOW groups showed similar SF intake across all testing points. Conclusions: These findings support the hypothesis that orosensory stimulation across DIO is higher in the dynamic compared to static phase. However, changes in orosensory stimulation do not necessarily generalize to increased intake of other palatable stimuli.
Body Composition, Modeling, and Thermogenesis

T-412-P
An Objective Estimate of Energy Intake During Weight Gain Using the Energy Balance Method

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Background: Objective assessments of energy intake (EI) in humans can be derived from measures of total daily energy expenditure and changes in energy stores, but this method has not been tested in response to weight gain. We tested the accuracy and precision of the energy balance method to estimate EI during weight gain in conjunction with controlled overfeeding.

Methods: Doubly labeled water (DLW) and body composition data (by DXA) from two independent studies of controlled overfeeding; 1 inpatient study (n=8) and 1 outpatient study (n=33) were used in this analysis. Energy requirements at baseline were determined from a DLW study and controlled overfeeding before consumption of 40% additional calories for 56 days. Results: The calculated EI from the combined energy balance method were compared to the actual EI consumed. During the controlled inpatient study where physical activity was confined to the metabolic ward and all meals were consumed under supervision, the EI consumed was 3490±72 kcal/d. The calculated EI was 3489±811 kcal/d which was strongly correlated (r²=0.003, p=0.99) and showed no systematic bias for over- or under-estimation (r²=0.003, p=0.99). During the outpatient study, where food was prepared by the metabolic kitchen but consumed free-living, the EI consumed was 4266±483 kcal/d. The calculated EI was 3765±513 kcal/d which was strongly correlated (r²=0.001, p=0.99) and there is no significant bias with higher or lower actual EI. Conclusions: The energy balance method can be used to estimate EI during weight gain with a high precision when physical activity is limited and with good precision when physical activity is variable in free-living subjects.

T-413-P
Energy Balance with Weight Loss: Does It Add Up?

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Background: Many people report difficulty losing weight despite dietary attempts. Methods: Ten healthy obese adults (5M/5F; 36±811 kcal/d which estimated actual EI within 1.2±729 kcal/d. Actual and calculated EI were strongly correlated (r²=0.9, p<0.01) and showed no systemic bias for over- or under-estimation (r²=0.9, p<0.01) and showed no treatment differences in EI. Conclusions: EI was measured accurately within free-living obese subjects.

T-414-P
Sub-Thermoneural Housing Temperature Effects in Pre-Clinical Weight Loss Drug Development

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Background: To investigate the influence of ambient temperature (T) on outcomes related to weight loss drug treatment in mice. Methods: Eight-week old male C57BL/6 mice were singly housed at room temperature (22°C) or thermoneutrality (30°C) and ad libitum fed standard rodent chow (LFD-low fat diet) and water on a 12:12 light cycle. Mice were randomized (n=12/group) and treated for 8 wks with either placebo control, ephedrine (100 mg/kg/day) or β-3 agonist CL316,243 (0.1 mg/kg/day) mixed in peanut butter pills 2x/day. An additional high-fat diet (HFD) study using a 4-wk diet-induced obesity run-in was performed. Outcomes included body weight and energy intake, baseline/final body composition, metabolic rate and terminal serum analytes. Results: Change in body weight (final-baseline) and lean mass were not significantly different among treatment groups at either T, with LFD feeding, while change in fat mass (p=0.037) and relative fat mass (co-varied for lean, p=0.005) were significantly different among treatment groups at 22°C, but not 30°C. Conversely, treatment group differences in change in fat mass and fat% were observed at 30°C with HFD feeding (p=0.03), but not at 22°C. Analyzing all treatment groups combined, energy intake and metabolic rate were significantly higher at 22°C (v. 30°C) with either diet (42-55%, all p<0.0001), while final body weight and fat mass were significantly greater at 30°C (p<0.0001). Serum glucose was significantly lower at 30°C with both diets (p<0.0005); while T, differentially affected insulin (LFD:p=0.66; HFD:p<0.002) and leptin (LFD:p<0.003; HFD:p=0.53) dependent on diet, albeit with no significant treatment group effects. Conclusions: Potential interactions of T with drug treatments and diets should be considered in pre-clinical drug design and interpretation of outcomes, particularly those related to body composition.

T-415-P
Doubly Labeled Water Over- and Underestimates Energy Expenditure Changes During Restriction of Dietary Fat and Carbohydrate, Respectively

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Background: Dietary macronutrient composition may influence body weight partly by modulating energy expenditure (EE). Measurements of EE using the doubly labeled water (DLW) method (EE_{DLW}) have yet to be validated against metabolic chamber measurements (EE_{MCh}) during both energy balance and caloric restriction with differing diets. Methods: We investigated twelve inpatient obese volunteers (8F/4M) who were fed an energy balanced diet for 5 days immediately followed by 30% caloric restriction with selective removal of carbohydrate (LC) or fat (LF) for 6 days. After a 2-4 week washout, volunteers repeated the 5-day balanced diet followed by the alternate LF or LC diet. Participants spent days 2, 5, 6, 9, and 11 in a metabolic chamber. On day 1, the subjects were given an oral dose of DLW and urine samples were collected daily. EE_{DLW} was calculated using indirect calorimetry equations from 24-hr consumes and CO2 production measurements. EE_{MCh} was calculated using the DLW measurements of average daily CO2 production and the food quotient (FQ) of the diet. Results: During the balanced diet, EE_{DLW} was -2479±463 kcal/d which was lower than EE_{MCh}=2618±545 kcal/d (p=0.02) but these measurements were highly correlated (r=0.91, p<0.001). EE_{MCh} decreased by 58±98 kcal/d (p=0.03) and 49±97 kcal/d (p=0.05) in the LC and LF diets, respectively. EE_{MCh} was unchanged during LC diet (-1±348 kcal/d, p=0.49) compared with the balanced diet, but decreased by 125±233 kcal/d (p=0.05) during LF diet. FQ was lower after LC (0.81) and higher after LF (0.92) compared to the balanced diet (0.86). 24hr respiratory quotient decreased after LC (0.80±0.02, p<0.001), but was unchanged by LF (0.87±0.03, p=0.1) compared with balanced diet (0.86±0.03). Conclusions: EE_{DLW} overestimated the EE_{MCh} decrease during the LF diet and underestimated the EE_{MCh} decrease during the LC diet.
T-416-P
Inter-Individual Correlations of Background Enrichments of $^{18}$O and $^2$H in Humans As a Possible Means for Improving Precision of the Doubly Labeled Water Method
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Background: The precision of the doubly labeled water (DLW) method for measuring total daily energy expenditure (TDEE) in humans is limited by variation in the background isotope enrichments. The factors that drive this background variation remain uncertain. However, if these factors are correlated across individuals, precision could be improved using background variation of unlabelled subjects in parallel to the dosed subjects. The purpose of this study was to quantify natural background variations in the $^{18}$O and $^2$H in humans and evaluate the individual to individual correlation. Methods: Urine samples were obtained for 30 consecutive days in forty healthy adults (20 males, 20 females), varying in age (23-62 yr) and body mass index (16.8-32.6 kg/m²). Samples were collected from the first void in the morning and stored in 5 ml glass vials. Results: Background fluctuations varied in both magnitude and direction between subjects and over time. Within a sample, $\delta^2$H and $\delta^{18}$O were strongly and significantly correlated ($R^2=0.92$), but fluctuations were uncorrelated between subjects, within a subject, or with time. Errors in the calculation of TEE by the DLW method due to the magnitude of background fluctuations were modeled using equations as outlined by Schoeller et al. (1986) and found to contribute to a minimum 7% precision error. This error was not reduced by using simultaneous samples from undosed subjects. Conclusions: Isotope background fluctuations of $\delta^2$H and $\delta^{18}$O are correlated within a sample, but not within subjects, among subjects, or over time. These data confirm that natural isotope background fluctuations are a significant contributor to the overall precision error in DLW measurements of TEE and suggest that using undosed subjects to model background variations is not a viable strategy.

T-417-P
Increased Resting Energy Expenditure, Diet-Induced Thermogenesis and Preferential Carbohydrate Oxidation after Roux-en-Y Gastric Bypass
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Background: Malabsorptive bariatric procedures such as Roux-en-Y gastric bypass (GBP) lead to greater weight loss than diet alone. We hypothesize that GBP leads to an increase in energy expenditure (EE), both fasting and postprandially, and shift in nutrient partitioning favoring carbohydrate (CHO) oxidation, that is related to altered bile acid (BA) metabolism after GBP. Methods: Obese subjects without diabetes, studied either prior to (n=16) or 1 year post-GBP (n=9; n=4 at both timepoints) underwent indirect calorimetry and blood collection both during fasting and postprandially (0-360min) after a 600kcal meal (36% CHO, 14% PRO, 16% FAT). Total glucagon-like peptide-1 (GLP-1), BA levels and composition, and gastric emptying (GE) rates were measured using RIA, mass spectrometry, and the acetylaminoephenn method/spectrophotometry, respectively. Results: All comparisons are pre-vs. post-GBP. Body weight (BW) and BMI were significantly lower post-GBP (p<0.001). Resting EE was significantly higher post-GBP (15.6±1.6 vs. 17.9±3.0 kcal/kg BW, p<0.05). Dit was higher post-GBP during the first 60 min after the meal (AUC 0-60min; 2.6±1.1 vs. 7.3±3.2 kcal/kg, p<0.001) as well as overall during the entire postprandial period (AUC 0-360min; 0.33±0.17 vs. 0.75±0.27 kcal/kg/min, p<0.01). Preferential CHO oxidation was observed solely during the first 60 min after the meal (RQ 0.78±0.06 vs. 0.96±0.06, p<0.01) post-GBP. No significant change in fasting RQ was observed. GLP-1 levels and GE rates will also be presented. Fasting and postprandial BA levels and composition will be analyzed in a subset of subjects and correlated with indirect calorimetry measurements. Conclusions: After GBP, REE and Dit are increased, and nutrient partitioning is shifted to favor CHO oxidation. Potential mechanisms will be discussed.

T-418-P
Energetic Adaptations Persist After Bariatric Surgery in Obese Adolescents
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Background: Bariatric surgery weight loss induces energetic adaptations involving the hypothalamic-pituitary-thyroid and -adrenal axes. Energetic adaptations induced by bariatric surgery have not been studied in adolescents or for extended periods post-surgery. Methods: Study objective is to measure energetic responses to Roux-en-Y gastric bypass (RYGB) performed in extremely obese adolescents (n=11) relative to weight-matched controls (n=5). At baseline, and 1.5, 6 and 12 mo post-surgery, 24-hr room respiration calorimetry, body composition and fasting hormones were measured. Results: Mean TEE was 3189 kcal/d pre-surgery, and 2420, 2363 and 2323 kcal/d 1.5, 6 and 12 mo post-surgery, equal to a 24% reduction in TEE. Mean weight loss was -16, -18 and -10 kg at 1.5, 6 and 12 months post-surgery, equivalent to 11, 14 and 9% of weight. Reduction in FFM was -7.4, -0.12, and -0.15 kg, equivalent to 10, 0.3 and 0.4% of FFM. Adjusted for changes in fat-free mass (FFM) and fat mass (FM), TEE was -609, -561 and -664 kcal/d lower at 1.5, 6 and 12 mo post-surgery compared to pre-surgery (p<0.001). Basal metabolic rate and sleeping energy expenditure decreased by 18% and 24% at 1.5 mo post-surgery (p<0.001), and then remained constant. The fall in EE was disproportionately large compared with the reduction in weight post-FM. Changes in TEE were significantly associated with parallel changes in total triiodothyronine, leptin, insulin and noradrenaline. Weight stability and steady EE were observed in the controls. Conclusions: RYGB suppressed EE to a greater extent than the reduction in body weight and FFM. Persistent energetic adaptations may hinder further weight loss and contribute to weight regain in severely obese adolescents.

T-419-P
Quantifying the Energy Balance Dynamics of Childhood Growth and Obesity
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Background: Clinicians and policymakers need the ability to quantitatively predict how childhood weight will respond to obesity interventions. Methods: To address this issue, we developed the first validated mathematical model of childhood energy balance that accounts for normal growth, development of obesity, and makes quantitative predictions about the effect of interventions. The model was calibrated to reference body composition data in normal children and was validated by comparing its predictions to data not used to build the model. Results: The model accurately simulated the body composition changes during normal growth, and predicted increases in energy intake of ~1200 kcal/d and ~900 kcal/d from ages 5-18 years in males and females, respectively. The development of childhood obesity was found to require a substantially greater excess energy intake per kg excess weight gain compared to adults. For example, children under 10y required greater than 200% of the adult increment in energy intake per kg excess weight gain. Furthermore, the typical energy balance calculations using growth charts vastly underestimated the excess energy intake in overweight and obese children calculated using our model. At the population level, we found that the excess weight of US children in recent years translates to an average energy intake excess of ~200 kcal/d per child compared to the late 1970s. The model also suggests that there may be therapeutic windows of weight management when children can “outgrow” obesity without requiring weight loss, especially during periods of high growth potential in males who are not severely obese at the onset of treatment. Conclusions: By calculating the likely weight changes resulting from proposed interventions, our model provides a new tool for strategizing about efforts to end the childhood obesity epidemic.
T-420-P
High Dietary Selenium Intake Is Associated with a Low Percentage of Body Fat in the Newfoundland Population
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Background: Selenium is a trace element involved in the regulation of enzymes related to fatty acid oxidation. Previous animal studies have shown that selenium inhibits adipocyte hypertrophy and decreases abdominal fat. However, to the best of our knowledge there are no studies available on the effect of dietary selenium on adiposity status in humans. Therefore, we designed this study to investigate the association between selenium intake and body fat percentage in a large population based study. Methods: A total of 2808 subjects from the CODING (Complex Disease in Newfoundland population: Environment and Genetics) study were assessed. Dietary selenium intake was evaluated from the Willett Food Frequency Questionnaire. Whole body composition measurements were performed using dual-energy X-ray absorptiometry (DXA) Lunar Prodigy (GE Medical Systems, Madison, WI).

Results: A significantly negative correlation was found between dietary selenium intake and total body fat percentage in the entire cohort (r = -0.21, p < 0.001), and in males (r = -0.27, p < 0.001) and females separately (r = -0.10, p < 0.001). However, after adjusting for age, physical activity, and alcohol consumption the inverse correlation between dietary selenium intake and percent of body fat only remained significant in males (unstandardized β = -0.12, p < 0.001).

Conclusions: Our findings suggest that higher dietary selenium intake is associated with improved body composition, and this beneficial effect is gender specific.

T-421-P
Adiposity and Indicators of Thyroid Status in Children and Adolescents
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Background: In adults, obesity is associated with abnormalities of thyroid function. However, there are fewer studies in pediatric cohorts. We therefore examined associations of weight and adiposity with indices of thyroid function in children. Methods: A sample of 1,203 non-obese (BMI<95th percentile) children 5-18y had height, weight, fat mass by DEXA (n=829), and morning thyroid-stimulating hormone (TSH), free thyroxine (FT4), lipids, and leptin measured. Analyses examined predictors of TSH and FT4 accounting socio-demographic factors. Results: The sample included 631 non-obese and 572 obese subjects. TSH was positively related to BMI Z-score and fat mass (p<0.001). FT4 was negatively related to BMI Z-score and fat mass (p<0.001). TSH was positively correlated to leptin (p<0.001) even after accounting for fat mass. A positive association between TSH and triglycerides (p<0.001), and a negative relationship between FT4 and triglycerides (p=0.001) was found in both samples, even after accounting for fat mass. As previously reported in adults, non-Hispanic Blacks had a lower TSH than non-Hispanic Whites (p<0.007).

Conclusions: We conclude that pediatric obesity is associated with higher TSH and lower FT4 concentrations and with a greater prevalence of abnormally high TSH measurements. It seems likely that leptin and thyroid status are interrelated, perhaps through leptin’s effects on TSH secretion, as leptin and fat mass were positively associated, even when controlling for adiposity.

T-422-P
Variability of Body Mass Index During Childhood Predicts Adult Obesity Risk: The Bogalusa Heart Study
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Background: It is well known that childhood obesity leads to increased obesity risk in adults. However, it is not known whether variability in obesity measures during childhood is also predictive of adult obesity risk. This study tested the hypothesis that variability of body mass index (BMI) was associated with adult obesity risk. Methods: The study cohort consisted of 2,901 participants (1,625 whites and 1,276 blacks; age=20-51 years at follow-up) who had been examined at least 4 times for cardiovascular risk factors during childhood (age<20 years). Variability of BMI was depicted as coefficient of variation (CV) and standard deviation (SD) during childhood. The average follow-up period was 25.6 years. Results: Blacks versus whites had significantly greater BMI variability during childhood. Mean levels of BMI were significantly correlated with variability measures (r=0.22 for CV; r=0.50 for SD) during childhood. After adjustment for mean levels of BMI and other covariates, childhood BMI CV was significantly associated with BMI in adults, with every 10% increase in CV associated with 3.8 BMI units increase (P<0.0001). Similarly, CV during childhood was also associated with risk of obesity (BMI>30 kg/m2) in adults (P<0.0001); compared with the bottom CV quartile, odd ratio for being obese was 1.9 (95% confidence interval: 1.3-2.7), 2.5 (95% CI: 1.7-3.7), 9.8 (95% CI: 6.6-14.6) for the second, third, and top CV quartile, respectively. Similar results were observed if SD was used to measure BMI variability. Conclusions: These findings indicate that the variability of adiposity during childhood is predictive of adult obesity risk, independent of levels of obesity measures. The underlying mechanisms for the reported associations need further investigation.

T-423-P
Changes in Free-Living Energy Intake Can Be Accurately Calculated Using Repeated Body Weight Measurements and a Mathematical Model of Human Metabolism
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Background: Obesity research is hampered by the inability of self-reported food intake to accurately measure free-living energy intake (EI). This has been demonstrated by comparing self-reported EI to energy expenditure (EE) measured by the doubly labeled water (DLW) method in weight stable individuals. During weight loss, EI-EE and measuring EI requires repeated DLW doses along with repeated dual-energy X-ray absorptiometry (DXA) scans to calculate changes in body energy stores. While this DLW-DXA methodology is theoretically sound, it is prohibitively expensive and requires specialized equipment and training. Methods: We developed an inexpensive method for calculating EI changes that uses repeated body weight measurements with a validated mathematical model of human metabolism. This method was applied to data from Phase 1 of the CALERIE study in 18 overweight adults randomly assigned to two outpatient diet interventions for a 6 month period.

Results: The model calculations of EI change correlated well with the DLW-DXA method (r=0.81, p<0.0001). However, the model tended to underestimate EI change by 104±241 kcal/d (p=0.014) because it assumed a constant physical activity. Examination of the EE data demonstrated a reduction in physical activity that appeared to correlate with EI change. To quantify this effect we used the “leave-one-out” cross-validation method to calculate that physical activity decreased by an average of -0.9 kcal/kg/d for every 1000 kcal/d decrease in EI. Adding this model parameter eliminated the bias of the model-calculated EI change (39±263 kcal/d, p=0.378) while remaining highly correlated with the DLW-DXA method (r=0.81, p<0.0001).

Conclusions: We demonstrated that an inexpensive model-based calculation of EI change using only repeated body weight measurements agrees well with the DLW-DXA method.

T-424-P
Laboratory Evaluation of the Modular Signal Recorder Triaxial Accelerometer for Measuring Physical Activity
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Background: Physical activity is important for multiple aspects of health including but not limited to: cancer prevention, metabolic disease treatment for diabetes, hyperlipidemia, cardiovascular health and obesity management. There is growing need for technologies that accurately measure physical activity. In this study we validated a tri-axial accelerometer embedded in the Modular Signal Recorder (MSR) 145 data logger. Methods: Seven subjects wore the MSR145 data logger along with the validated Physical Activity Monitoring System (PAMS) with different body postures and throughout graded walking at seven velocities. Energy expenditure was measured using indirect calorimetry. Results: The seven subjects’ laboratory validation testing showed the MSR145 data logger distinguished sedentary and walking activity reliably within 1/2 mph walking speed increments. It was accurate and precise compared to the PAMS, with an intra-class correlation coefficient (r>0.95). The MSR145 data logger showed excellent sequential increases with increased walking velocity (r>0.95) and energy expenditure (r>0.94).

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For author conflict of interest information, see page S264
Conclusions: The MSR145 data logger was shown to be accurate and reliable in measuring and quantifying physical activity in the laboratory setting. A comprehensive integrated physical activity measuring device using the MSR145 data logger holds promise in the free living society.

T-425-P
Fat Tissue Bomb Calorimetry in Subjects Undergoing Weight Loss Intervention
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Background: The accepted caloric value for lipid (9 kcal/g) is often used to estimate energy content of adipose tissue (AT). Yet, AT is more than just lipid and its actual caloric content or how this changes with weight loss is not known. Methods: Ten obese individuals (5M/5F; age=35±7.7 yrs, weight=103.9±14.2 kg, percent body fat=42±9%) were admitted to a clinical research unit for 10 weeks including 6 weeks of 50% caloric restriction. We investigated the caloric content of AT and adipocyte size (ACS) prior to and following weight loss. Each participant underwent a biopsy of the abdominal subcutaneous AT pre- and post-diet. Fresh AT was immediately analyzed for ACS in duplicate using a Coulter Counter. The remaining AT was flash frozen and later thawed for direct bomb calorimetry in an Isoperibol calorimeter using mineral oil as a spiking agent. Each bomb calorimetry sample was analyzed 10 times. Results: Pre-intervention, mean AT caloric density averaged 5.85±0.47 kcal/g and ACS averaged 52±12uM. Post-intervention, mean AT caloric density averaged 5.99±0.29 kcal/g and ACS averaged 58±15uM. In a mixed model analysis of adipose tissue kcal/g to account for repeated measures within individuals, and including study intervention phase, age, sex, and %fat as covariates, post-intervention kcal/g AT was found to be greater than the pre-intervention density (Δ=−183.66±92.38 kcal/g; p=0.048). Inter-individual variation in AT caloric content accounted for a greater amount of the variance than did weight loss (p=0.001).

Conclusions: Adipose tissue caloric content, as measured by bomb calorimetry, was less than the expected 9 kcal/g, and the caloric density per gram AT increased after weight loss. This is likely in part due to changes in non-lipid components in AT such as stromal vascular cells, proteins, and blood vessels.

T-426-P
Validation Study of the Body Adiposity Index (BAI) as a Predictor of Percent Body Fat in Older Individuals: Findings from the BLSA
Hui Chang Lubbock, TX; Eleanor Simonsick, Luigi Ferrucci Baltimore, MD; Jamie A. Cooper Lubbock, TX

Background: A new body adiposity index (BAI) has been developed and validated in adult populations as an indicator of percent body fat (%fat). Objective: To assess the validity of the BAI (BAI = (hip circumference)/((height)² × 18) in an older population (mean age 70.4±9.5 yrs). Methods: We used Pearson correlations for both BAI and body mass index (BMI) with %fat (assessed by dual-energy X-ray absorptiometry (DEXA)) in 954 older adults (age ≥55yrs) from the Baltimore Longitudinal Study of Aging (BLSA). For a sub-analysis, correlations were also performed by sex. Measurements included DEXA, weight, height and hip circumference. Results: There were significant correlations between both BAI and BMI with %fat but BAI was more strongly correlated with %fat% than BMI (r=0.7 for BAI and fat% vs. r=0.6 for BMI and fat%, p<0.01) for all subjects. BAI also exhibited a smaller mean difference from fat% (5.2±6.0 for BAI vs. -7.6±7.2 for BMI, p<0.01) indicating better agreement. For the subanalysis by sex, however, BMI showed better agreement with fat% than BAI did (r=0.6 for BAI and fat% vs. r=0.7 for BMI and fat%, p=0.01) with a smaller mean difference from fat% (3.0±6.0 for BAI vs. -2.2±5.2 for BMI, p<0.01) in men. Finally, BAI did not accurately predict fat% when DEXA measured body fat percentage fell below 15%. Conclusions: BAI provides valid estimates of body adiposity in an older adult population; however, BMI may be a better index for older men. Finally, BAI was not accurate in people with low levels of adiposity (15% body fat or lower).

T-427-P
Lower Awake and Fed Thermogenesis Predicts Future Weight Gain in Subjects with Abdominal Adiposity
Paolo Piaggi, Jonathan Krakoff, Clifton Bogardus, Marie S. Thearle Phoenix, AZ

Background: Awake and fed thermogenesis (AFT) is the energy expenditure (EE) of the non-active fed condition above the minimum metabolic requirement during sleep, and is composed of the thermic effect of food and the cost of being awake. The relationship of this component of EE with body size, fat distribution, and future weight change are not fully established. Excess adipose tissue may increase thermal insulation of the abdomen, limiting the body’s capacity to release heat into the environment. This suggests that any effect of AFT on weight regulation may be augmented in obese subjects. Methods: AFT was estimated from whole room 24-h EE measures in 509 healthy subjects (315M/194F, 368 Native Americans and 141 Whites, age: 29±8 yrs, BMI: 33±8 kg/m², body fat: 31±9%) while subjects consumed a eucaloric diet. Follow-up data was available for 290 Native Americans (median follow-up time: 6.6 years). Results: AFT accounted for approximately 10% of 24-h EE. Energy intake was the major determinant of AFT (p=0.29, P<0.001). AFT, normalized as a percentage of intake, was inversely related to age and fasting glucose concentration (p=0.19 and p=0.17, P<0.001), and showed a nonlinear relationship with waist circumference and BMI. Spline analysis demonstrated that AFT becomes inversely related to BMI at an inflection point of 29 kg/m². The residual variance of AFT after accounting for known covariates predicted future weight change but only in subjects with a BMI>29 kg/m², such that a 100-kcal decrease from the predicted AFT value corresponded to an average 0.4 kg increase in body weight per year.

Conclusions: AFT is reduced in individuals with a BMI>29 kg/m², and predicts future weight gain in these subjects. Once central adiposity develops, a blunting of AFT may occur that then contributes to further weight gain.
T-429-P
What Predicts Visceral Adipose Tissue: Trunk Shape or Trunk Size?
Robert C. Moore, Diana Thomas Montellate, NJ; Steven B. Heymsfield Baton Rouge, LA; Manfred Mueller, Anja Bosy-Westphal, Kiel, Germany; Courtney M. Peterson Baton Rouge, LA

Background: Trunk shape is a known predictor of amounts of visceral adipose tissue (VAT). The amount of total adipose tissue in the abdomen also predicts visceral adipose tissue mass but it is unknown how much of VAT can be attributed to abdominal shape versus size. Using two new measures of trunk shape and trunk size, we investigated how shape and adiposity along with demographic covariates are related to amounts of visceral adipose tissue. Methods: Subject data were pooled from two studies containing dual energy X-ray absorptiometry measured fat mass, and magnetic resonance imaging measured VAT mass. Eight separate indices: A Body Shape Index (ABSI), BMI, waist circumference (WC), hip circumference (HC), trunk size, waist/hip ratio (WHR), trunk shape, and body adiposity index (BAI), were examined as predictors of total VAT mass and % of body weight as VAT using multi-linear regression. 192 different regression models were developed that predict VAT mass. Results: Adjusted R^2 values were consistently higher in males than females. Our new measures indicated that trunk size explains much more of the variance in VAT than trunk shape does. Interestingly, in men, trunk size and shape were correlated, indicating that as men become more obese, they tend to store fat in a “pot-belly” pattern, whereas no correlation between trunk size and shape existed in women. Of all 8 indices tested, WC was found to be the most accurate predictor for VAT and %VAT for both genders, and including age as a covariate improved every adjusted R^2 value.

Conclusions: Trunk size is a better predictor of VAT than trunk shape even after adjusting for age, gender, and height.

Thursday, November 14, 2013
Posters on Display: 10:00 AM – 3:30 PM
and 5:30 PM – 7:00 PM
Location: Exhibit Hall A

T-430-P
Weight Management Program Participants Achieve Substantial Risk Factor and Medication Changes with Weight Loss
Linda Gennof, Linda Grant Boston, MA

Background: Employers and health insurers are concerned about the adverse impact of obesity and the need for effective options. The 2013 Workplace Wellness Programs Study by RAND Health reported an average loss of about 1 lb per yr for 3 yrs. Clearly, weight management programs must demonstrate greater outcomes in order to achieve health and financial benefits. Methods: This study assessed weight, risk factor and medication changes for 1256 participants in the Health Management Resources® Program for Weight Management from 2010 to 2012. Patients in the Health Management Resources® Program for Weight Management (HMR®). All patients had an initial health risk appraisal (HRA) on program entry and a follow-up HRA in 2012. Results: The average weight loss being kept off was 43 lbs (17.8% of initial weight) over 3.6 yrs (average time between initial and follow-up). The average BMI decreased 10.5 points (40.5 to 30.0 kg/m2) vs. a 0.15 BMI reduction reported in the RAND study. The average weight gain being kept off was 20 lbs (8.5% of initial weight) over 3.6 yrs (average time between initial and follow-up). The average BMI increased 0.8 points (27.2 to 28.0 kg/m2) vs. a 2.1 BMI increase reported in the RAND study. Conclusions: This study supports the effectiveness of weight management programs in reducing BMI and weight gain, which can lead to substantial improvements in risk factors.

T-431-P
Validation of a New Six Factor Lifestyle Pattern Questionnaire
Robert F. Kushner, Seung W. Choi, James L. Burns Chicago, IL

Background: The purpose of this study is to validate a simplified and practical lifestyle patterns questionnaire among overweight and obese individuals. Methods: Based on previous research on unhealthy lifestyle patterns (Kushner & Choi, 2010), a 27-item questionnaire was developed to measure six hypothesized dimensions of Adelphic Diner (AD), Fast Pacer (FP), Food Lover (FL), Couch Champion (CC), Self-Scrutinizer (SS), and All or Nothing Dieter (AN). Each dimension is measured by 4 to 6 items. The internet-based questionnaire was administered to a sample of 640 respondents, 342 (53%) of which completed the Impact of Weight on Quality of Life (IWQOL-Lite). Results: The average age (sds) of the respondents was 40 (sd=11), 13% M and 87% F; 58% Caucasian; 24% Black; 12% Hispanic. Weight status: 16% normal weight, 22% overweight, 23% Class I, 15% class II and 24% class III obesity. Cronbach’s internal consistency reliability estimates for the six subscales were as follows: AD (.80), FP (.83), FL (.84), CC (.81), SS (.81), and AN (.70). Odds Ratio for endorsement of each of the 6 lifestyle patterns was statistically correlated with increasing BMI classification (p<.001). Significant correlations were seen between the lifestyle patterns and worsening IWQOL-Lite dimensions. Conclusions: A new lifestyle patterns questionnaire developed by factor analysis is highly correlated with BMI classifications and reduced quality of life. The questionnaire can be a useful measure of unhealthy lifestyle behaviors among the overweight and obese population.

T-432-P
The Clinical Utility of Genetic Testing for Type 2 Diabetes: Results from a Randomized Trial

Background: The clinical utility of genetic testing for type 2 diabetes (DM) is unknown. In this randomized trial, we examined whether supplementing conventional DM risk counseling with genetic test results affected clinical and behavioral outcomes. Methods: Participants were outpatients aged 21-65 with body mass index (BMI) ≥ 27 and without DM. At baseline, fasting plasma glucose (FPG), family history of DM, and lifetime DM risk (based on age, sex, race, and BMI) were assessed. After 2-4 weeks, participants received risk counseling on FPG, family history, and lifetime risk, followed by either DM genetic test results (CR+G; N=303) or attention control eye disease counseling (CR+YE; N=298). The primary outcome was weight 3 months post-enrollment. Secondary outcomes included HOMA-IR, self-reported dietary intake and physical activity at 3 and 6 months, and weight at 6 months. Linear mixed models were fit for weight, HOMA-IR, and dietary variables; generalized linear mixed models using a negative binomial distribution with a log link were used for walking and moderate physical activity. Models included a common intercept, time effect, time*treatment interaction, and randomization stratification variables (family history and BMI). Results: Mean age was 54, 42% were White, 53% were Black, 80% were male, 30% had BMI ≥ 35, and 53% had moderate/high family-history-based DM risk. There were no differences between groups in estimated means for any outcomes with one exception: caloric intake decreased more from baseline to 3 months in the CR+G arm than the CR+YE arm (p=0.04). In post-hoc analyses, treatment effects did not differ by level of family history risk (both arms) or genetic risk (CR+G arm). Conclusions: Because genetic testing for DM did not make a clinically important impact on patients at risk for DM, it may not be appropriate for widespread implementation.

T-433-P
Changes in Sexual Quality of Life with Massive Weight Loss
Krista Castleberry, Cynthia Buffington, Keith C. Kim Celebration, FL

Background: Sex life may be adversely affected by overweight and obesity. In the present study we have examined the sexual quality of life (QoL) of individuals with severe obesity before and after massive weight loss. Methods: The study population included 104 bariatric surgical candidates and 25 lean controls. Study participants completed the Impact of Weight on Quality of Life (IWQOL) questionnaire which consists of 8 QoL scales including sexual life QoL. Preoperatively, scores for sexual life QoL were examined relative

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Patients enroll in weight loss programs with varied success. The purpose of this study was to assess the relationship between adherence to weekly visits while enrolled in a weight loss program, patients’ weight loss, and patients’ retention rate. Methods: This is a retrospective, cross-sectional study with weight loss expressed as a percentage of patients’ current body weight compared to starting body weight. Data collection occurred at one location and continued until patients discontinued the program (maximum of 16 weeks). New patients (n=477) with initial consultations during the months of January, February, May, June, September and October of 2010 were included. Adherence was defined as excellent (patients missed less than two clinic visits), fair (patients missed 2 clinic visits), and poor (patients missed 3 or more clinic visits). Weekly weight loss in the three adherence categories was compared using the Wilcoxon rank-sum test. Results: Nearly two-thirds of the patients lost at least 5% of their body weight and more than one-third lost at least 10% of their body weight. Over the 16-week period, excellent adherence patients lost 5.5% more weight than those who were less adherent. Their body weight faster than poor adherence patients [15.4% vs. 9.6% (p<0.01)]. Conclusions: Our findings are consistent with other studies that have linked patients’ outcomes in weight loss programs to patient adherence. Results indicate that patients with excellent adherence to the program lost more weight than those who were less adherent.

T-437-P
Extending Sleep in Obese Adults to Promote Weight Loss
Ann E. Rogers, Melinda Higgins Atlanta, GA; Michael Perlis, Stephanie S. Vander Veur, Gary D. Foster Philadelphia, PA

Background: Epidemiologic studies show a dose-dependent relationship between reduced sleep duration and increased body mass index (BMI) and laboratory studies have also documented that sleep loss appears increases appetite. It has been suggested—but never tested—that extending sleep would facilitate weight loss. This pilot study compared the efficacy of sleep extension in combination with a traditional weight loss program for facilitating weight loss in obese individuals. Methods: Twenty-one participants (18 female, 3 male, mean age 42.9 ± 14.2 years, mean BMI 33.5 ± 4.6 kg/m2) were randomly assigned to weight loss (WL) or weight loss plus sleep extension (WL+SE) groups. Sleep was extended in 15-minute increments and measured by wrist actigraphy. A behavioral weight loss program, based on the Diabetes Prevention Protocol was used to promote weight loss. Outcome measures include weight loss, blood pressure, fasting glucose levels, insulin levels and HOMA. Results: Although participants in the WL+SE group increased their nocturnal sleep duration by 18 minutes (p=0.05) at 24 weeks, there were no significant differences in weight loss between the two groups (6.9 kg versus 1.7 kg, p=0.175). There were also no differences in blood pressure, fasting glucose levels, or HOMA between the two groups. Only insulin levels decreased significantly in the WL+SE group (p=0.04). Conclusions: This study demonstrates: 1) it is possible to increase sleep duration in obese adults who regularly obtain insufficient sleep; and 2) combining sleep extension and behavioral weight loss treatment centers no benefit on weight loss or metabolic outcomes compared to behavioral weight loss treatment alone.
T-438-P

Influence of Children on Weight Outcomes for Adults Participating in an Internet-Based, Behavioral Weight Control Intervention
Elizabeth S. Kuhl, Elissa Jelalian, Chantelle N. Hart, Trecia M. Leahy, Rena R. Wing Providence, RI

Background: Family-based change is important to pediatric weight management, but few studies have examined whether having children and child weight status influence adult weight control efforts. This secondary data analysis explored the impact of having children and child weight status on home food environment and weight outcomes in 177 overweight and obese adults who participated in a 12-week internet behavioral weight loss program (PA assessed by pedometers), and (2) within randomized behavior intervention (PA assessed by Bite Counters). Clustering of physical activity (PA) demonstrates clustering of physical activity (PA) levels in two specific contexts within naturally-occurring social networks over time. Existing evidence also suggests that obesity and related health behaviors are known to cluster with PA assessed by pedometers, and (2) within randomized behavior intervention (PA assessed by Bite Counters). Clustering of physical activity (PA) demonstrates clustering of physical activity (PA) levels in two specific contexts within naturally-occurring social networks over time. Clustering of Accelerometer-Verified Physical Activity Outcomes

Methods: Height and weight measures were taken and a self-report home food environment questionnaire collected from all participants (mean age=47.48±10.26, 85% female, 89% White) at baseline and post-treatment. Participants reported sex, age, height, and weight status for each child≥18 years-old living in their home. Based on these data, participants were classified as having no children (NC; n=104), all normal weight children (NWC; n=41), or ≥1 child who was overweight (OWC, n=31). Results: At baseline, groups did not differ on adult BMI or home fruit and vegetable availability. However, participants with children, irrespective of child weight status, had more salty snacks (p<.05) and kid-friendly foods (e.g., sugar-sweetened cereals; p<.001) in their homes compared to NC. Moreover, relative to NC, OWC participants drank more sweet beverages (p<.001) and WVC participants had more sugar-sweetened beverages (p<0.05) at home. All participants lost a significant amount of weight during treatment, but groups did not differ on percent weight loss (mean=6.3% across groups; p=0.78). Time x group interactions were not found for assessed foods; all participants increased home fruit availability from pre- to post-treatment (p<.01). Conclusions: Having children, irrespective of weight status, increases the obesogenic nature of the home food environment but does not appear to impact adult weight loss.

T-439-P

Facilitating Weight Loss with Real-Time Intake Feedback from a Wrist Worn Monitor
Michael L. Wilson Clemson, SC; Tonya F. Turner, Patrick M. O’Neil Charleston, SC; Eric R. Muth Clemson, SC

Background: The purpose of this pilot study was to determine if energy intake feedback from a wrist-worn monitor could facilitate weight loss. Methods: 19 overweight subjects were instructed to wear Bite Counters for 6 weeks to record their number of bites during all eating activities (EA). Subjects were instructed to wear the Bite Counter during all EAs and to turn on the Bite Counter before taking the 1st bite of food and off after taking the last bite of food. The participants (17 F; BMI M = 31.16, SD = 3.57) had b-weekly weigh-ins at which Bite Counter data were downloaded. Participants were divided into two groups, one that received feedback (n = 10) from the Bite Counter and daily bite count targets and one that received no feedback or targets (n = 9). Results: Although the groups did not differ significantly on weight loss, (t(17) = 0.88, p >0.05; d = 0.43) there was a trend toward greater loss in the feedback group (M = 2.08 kg, SD = 2.59 kg) compared to the no feedback group (M = 1.18 kg, SD = 0.57 kg). The effect size for this analysis (d = 0.43) was found to approach Cohen’s (1988) standard for a moderate effect (d = 0.50) suggesting that a larger N or longer weight loss period would produce a difference between groups. Conclusions: The data support further research on the Bite Counter as a feedback tool to help individuals reduce intake and thereby lose weight.

T-440-P

Clustering of Accelerometer-Verified Physical Activity Outcomes within Behavioral Weight Loss Groups
Danielle Arigo, Stephanie G. Kerrigan, Meghan L. Butryn Philadelphia, PA

Background: Obesity and related health behaviors are known to cluster with naturally-occurring social networks over time. Existing evidence also demonstrates clustering of physical activity (PA) levels in two specific contexts: (1) in self-selected teams of individuals who participate in a web-based intervention (PA assessed by pedometers), and (2) within randomized behavioral weight loss (BWL) groups (assessed with self-report, which has limited validity). The present study extends this work by examining clustering effects on objectively-verified PA levels within randomized BWL groups.

Methods:

Participants were community-dwelling adults (N=172) with BMIs between 27 and 45 kg/m2 who were enrolled in a BWL RCT. All participants received the same weekly PA goal; goals increased by number of days per week and/or time per exercise bout every 2-3 weeks. Seven-day accelerometer-based PA assessments occurred at baseline and after 6 months of treatment. Results: Controlling for the effects of treatment condition and group membership, group membership (k=16) significantly predicted change in percent of time spent in vigorous activity and the overall amount of energy expenditure (kcal; p<.05). These effects were qualified by interactions with gender (p<.01). In addition, group membership accounted for small but significant percentage of the variance in total time spent in moderate-to-vigorous PA (MVPA; 6%), number of MVPA bouts in a week (5%), and percent of time spent sedentary (2%; p<.04). Conclusions: Together, these findings demonstrate small, but potentially meaningful, social influences on PA behavior in randomized BWL groups. Increased focus on social influence processes (such as support or comparison to others) in BWL groups may improve adherence to PA recommendations and overall PA outcomes in group-based BWL interventions.

T-441-P

Anhedonia is Related to a Poor Pattern of Learning and Predicts Decision Making Deficits in Obese Individuals on the Iowa Gambling Task
Marcia E. Gluck, Aleron Toledo, Alexis Graham, Colleen Venti, Marie S. Hearnle, Susanne B. Votruba, Jonathan Krakoff Philadelphia, PA

Background: Decision-making impairments may be related to obesity and maladaptive eating behaviors. The Iowa Gambling Task (IGT) simulates real-life decision-making by assessing ability to sacrifice immediate rewards in favor of long term gains. We hypothesized that IGT performance would be related to eating pathology and a measure of reward processing abnormalities. Methods: Seventy-six (53%) healthy obese volunteers (112±20 kg [Mas±SD]; 35±10 years) were admitted to an inpatient unit. While on a weight maintaining diet, they completed the IGT and questionnaires measuring anhedonia, binge eating and cognitive restraint. We categorized binge eaters (BE) as those reporting loss of control during overeating episodes. Subjects were divided into those with low vs. high anhedonia based on median scores. Results: Higher anhedonia (r=0.32, p=0.008) and lower restraint (r=-0.27, p=0.03) correlated with poorer IGT performance. BE had lower IGT total scores compared to non-BE (r=-4 vs. 4; p=0.02). Using a repeated measures ANOVA, we examined net IGT scores for each of the 5 blocks within the IGT (20 trials/block) to analyze the pattern of learning during the test. Those with high anhedonia did not improve their choice behavior over time, whereas participants with low levels of anhedonia showed a learning effect (F=2.4, p<0.05), indicating better performance during the latter part of the test. In a GLM, anhedonia (r=-5.23, p=0.02), but not restraint or BE, predicted total IGT scores, after controlling for weight, age, sex, race and education. Conclusions: Obese individuals who exhibit loss of pleasure and diminished interest in rewarding stimuli have less adaptive decision-making skills. This indicates an inability to delay gratification and preference for short-term rewards which may result in difficulty choosing behaviors that favor long-term health benefits.

T-442-P

An Innovative Care Model to Limit Gestational Weight Gain (GWG) and Minimize Macrosomia in the Obese Gravida
Janice Henderson, Matthew Goldshore, Erik Werner Baltimore, MD

Background: Obesity affects over 30% of pregnancies in the US and is associated with complications such as preeclampsia, gestational DM, postdates and c-sections. Prepregnancy BMI and excessive GWG are associated with complications such as macrosomia, stillbirth and long-term sequelae including pediatric obesity. For these reasons, we sought to reduce GWG in the obese gravida through an innovative care model. Methods: Obese Medicaid recipients presenting to Johns Hopkins Hospital from 12/2011 to 6/2013 were assigned to the Nutrition in Pregnancy clinic. Participants were exposed to a set of interventions to reduce GWG including: dedicated care by 2 Maternal Fetal Medicine physicians, systematic review of pregnancy and pediatric risks associated with obesity, counseling about appropriate GWG, high frequency prenatal visits (q2 until 36 w and weekly thereafter), in-depth nutritional consultation at the first visit followed by ongoing nutritional support, a prescription for 30 min of moderate daily exercise, and clinic-based social work and WIC services. Principles of behavioral modification were em-
The results suggest that bite count may aid individuals with calorie estimation when other aids are unavailable or be a less burdensome alternative to certain calorie estimation aids.

T-445-P Incentive Provision and Motives for Exercise in College First-Year Students, a Randomized-Controlled Trial Lizzy Pope, Jean Harvey-Berino, Huntington, VT

Background: A common criticism of incentives for health behaviors is that incentive provision undermines intrinsic motivation to carry out the targeted behavior. This study determined the impact of monetary incentive provision on participation motives for exercise in first-year college students. Methods: 117 first-year college students were randomized to one of three conditions: a control condition which received no incentives for meeting fitness-center use goals, a discontinued-incentive condition which received weekly incentives for 12 weeks during fall semester, and no incentives during spring semester, or a continued-incentive condition which received weekly incentives during fall semester, and incentives on a variable-interval schedule during spring semester. The Exercise Motivation Inventory 2 (EMI-2) measured exercise participation motives at baseline, end of fall semester, and end of spring semester. Repeated measures analysis using linear-mixed models compared motive changes in the three conditions. Results: Incentives did not decrease participation motives associated with intrinsic motivation in any of the conditions. Results also showed a significant decrease over time in the extrinsically associated EMI-2 domain of Weight Management. F(2, 216)=6.72, p<0.001 suggesting that participants' extrinsic participation motives to exercise decreased over the study period. Conclusions: Incentive provision did not undermine intrinsically associated participation motives for exercise. Therefore, incentives may be a positive way to encourage exercise behavior in college first-year students.

T-444-P Food Cravings among Bariatric Surgery Candidates Nina M. Crowley, Alok Madan, Sharlene Wein, Jennifer Correll, Laura Delustro, Jeffrey J. Borckardt, T. Karl Byrne Charleston, SC

Background: Food cravings are common, more prevalent in the obese, and may differ in those who pursue surgical treatment for obesity. Tools used to measure food cravings are most often validated in non-clinical, non-obese samples. The current study sought to explore the nature of food cravings in bariatric surgery candidates. Methods: In this retrospective study, the medical records of 250 consecutive bariatric surgery candidates at a large medical center were reviewed. Each completed a comprehensive medical, surgical, and psychological evaluation as part of standard of care. 227 candidates completed the Food Cravings Questionnaire – Trait (FCQ-T). A Principal Components Analysis (PCA) with varimax rotation was used to identify the factor structure of the FCQ-T. Results: Based on the Kaiser criterion, the PCA revealed a 7 factor structure that explained 70.89% of the variance. The seven factors were: 1) preoccupation with food, 2) emotional triggers, 3) environmental cues, 4) loss of control, 5) relief from negative emotions, 6) guilt, 7) physiological response. Conclusions: Food cravings in bariatric surgery candidates appear to be related most to preoccupations with food, unlike non-surgery seeking obese and non-obese populations. A tendency toward perseverative thoughts may be reflective of recent findings that executive dysfunction may adversely affect bariatric surgery outcomes. Psychotherapeutic approaches and/or neurostimulation techniques targeting these tendencies may improve bariatric surgery outcomes.

T-445-P To Succeed, or Not Succeed? That Is the Pre-Treatment Question Erin Lenz, Amy A. Goins Stortz, CT

Background: It has been well-established that behavioral weight loss interventions are intensive and expensive; therefore, elucidating pre-treatment health behaviors that may predict an individuals’ success is essential. Methods: Participants (N= 201; 48.9 ± 10.5 years; 78.1% women) enrolled in a study comparing a standard behavioral weight loss program (SB; n= 99) to a home-environment focused weight loss program (HE; n=102) completed baseline questionnaires assessing individual control variables (i.e., dietary restraint, self-weighting) and control over the home food environment (i.e., grocery shopping, meal preparation behaviors). Weight loss success (WLS), defined as maintaining a ≥5% weight loss at 18-months, was objectively

T-443-P Working on Weight Loss in Real Life: The Development and Assessment of the STRIDES Program Eileen Seeholzer, James Yokley, Charles Thomas Cleveland, OH

Background: Weight loss programs are often less effective in persons who are an ethnic minority, have lower income, or lower-literacy skills. Our team developed the STRIDES weight loss program: a 12-week group weight loss program designed at a 4th grade reading level. STRIDES stands for Steps to Reach Individual Diet and Exercise Solutions. STRIDES includes interactive group learning and individual counseling. STRIDES participants are obese African American (AA) adults recruited from an urban primary care practice. This evaluation assessed attendance and weight loss in STRIDES participants. Methods: Analysis of STRIDES program participants records from the program initiation in 2009 to 2012. Analyses comparing patient characteristics conducted using the Cochrane-Armitage Trend Test. Bivariate comparisons of the continuous items analyzed using the Chi-square. Results: 355 participants enrolled and 253 (71%) attended a class. Of the 253 who attended, 94 (37%) partially completed STRIDES and 99 (39%) completed STRIDES. Completers and drop-outs were: mostly middle-aged, AA women with an average initial body mass index of 42. 18% were at moderate or higher risk of having low health literacy. Mean weight loss was 8 lbs. (3%) but obscures STRIDES participants who were either responders and non-responders: 4 gained (2.8% mean); 27 unchanged; 55 lost (12 lb - 4.8% mean). 29% re-enrolled in another 12-week STRIDES session. Conclusions: STRIDES is an innovative program that uses pro-social values and individualized behavioral plans, to accommodate a range of preferences, resources, and literacy levels. STRIDES program participants had clinically meaningful weight loss. Further evaluation of the program’s effectiveness is warranted.

T-444-P Accuracy of a Bite-Count Based Calorie Estimation Compared to Human Estimates with and without Calorie Information Available James N. Salley, Adam Hoover, Michael E. Wilson, Eric R. Muth Clemson, SC

Background: Obesity is an increasing health problem in the US, associated with such dangerous health risks as heart disease and diabetes. Self-monitoring in the form of calorie counting is a critical aspect of successful weight loss. However, calorie estimations are subject to several perceptual and cognitive biases. The present study seeks to assess the accuracy of participants’ estimations of the calorie content of meals in the presence or absence of calorie information, and to compare their accuracy with calorie estimations based on bite count. Methods: Data were analyzed for 87 participants from a study in which participants were allowed to select from a wide variety of meals in a cafeteria setting. Participants were asked to estimate the number of calories they consumed while eating a meal or snacking. True calorie intake and a calorie intake estimation based on bite count were calculated for each participant. Results: A 2 (estimation method) x 2 (presence of calorie information) mixed-design ANOVA revealed a significant main effect for estimation method (F(1, 83) = 14.381, p < .001), a marginally significant effect for the presence of calorie information (F(1, 83) = 3.835, p = .054), and a significant interaction between estimation method and the presence of calorie information (F(1, 83) = 6.384, p < .05). Post-hoc tests revealed that errors in human calorie estimations were significantly reduced by the presence of calorie information (t(45.89) = -2.731 p < .01). Calorie estimations based on bite count were significantly more accurate than human estimates without the aid of calorie information (t(332) = -3.578, p < .005).

Conclusions: The results suggest that bite count may aid individuals with calorie estimation when other aids are unavailable or be a less burdensome alternative to certain calorie estimation aids.
OBESITY 2013 ABSTRACT BOOK
POSTER ABSTRACTS — WEDNESDAY, NOVEMBER 13 to FRIDAY, NOVEMBER 15, 2013

T448-P More Support That Support Matters: Perceived Support from Spouses Associated with Weight Loss Success
Meghan L. Butryn, Danielle Arigo Philadelphia, PA; Amy A. Gorin Storrs, CT

Background: Spouses and partners can exert a powerful influence on weight control through social and environmental processes. This study examined the relationship between perceived spouse/partner support and behavioral weight loss treatment outcomes. Methods: At baseline and 6 months (mid-treatment), participants (n = 179) rated the extent to which their spouse/partner (hereafter “partner”) supported their weight control efforts. Participants estimated their partner’s body size with a figure rating scale and reported at 6 and 12 months (end of treatment) if their partner’s weight had changed. Participants’ weight loss was measured at 6 and 12 months. Results: Ratings of perceived support decreased from baseline to 6 months (p < .05). Partners rated as larger on figure ratings were perceived as providing less support at 6 and 12 months (p < .04). Changes in support were associated with session attendance (r = .39, p < .01). Participants who reported decreased support attended 78% of sessions vs. 91% in those who reported increased or stable support (p < .01). Partner support at 6 months was associated with participant weight loss at 6 and 12 months (r = .22 and .26, p < .05). Participants with the highest ratings of support lost 12.6% at 6 months and 14.8% at 12 months, vs. 9.0% and 10.1% in participants with the lowest ratings of support (p < .05). At both 6 and 12 months, 51% of participants reported that their partners had lost >5 lbs. Conclusions: These findings further support the role of partner support in successful weight loss efforts, and suggest that a substantial proportion of partners may lose weight during the course of a 1-year treatment program. Experimental research is warranted to determine how increasing partner support for weight loss can improve treatment engagement and outcomes in participants and partners.

T449-P The Impact of a Weight Management Intervention Conducted During Pregnancy on One-Year Maternal and Newborn Weight: The Healthy Moms Trial
Kimberly K. Vesco, Michael C. Leo Portland, OR; Matthew W. Gillman Boston, MA; Janet C. King Oakland, CA; Cindy T. McEvoy, Njeri Karanja, Nancy A. Perrin, Cara Eckhardt, K. S. Smith, Victor J. Stevens Portland, OR

Background: It is unclear whether weight management interventions conducted during pregnancy can reduce postpartum weight retention and offspring overweight. Methods: We randomly assigned 114 obese (BMI ≥ 30 kg/m²) women at a mean of 15 weeks gestation to either a weight management intervention (IG) or usual care control group (CG). IG participants received an individualized calorie intake goal and advice to follow the Dietary Variety culation intervention outside the laboratory.

T450-P Evaluating the Components of a Computer Guided Intervention for Weight Loss: A Preliminary Analysis
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Background: Previous research indicates that weight loss increases with increased intensity of intervention. Computer systems provide interventions that can be specifically tailored. Such individualization requires analyses to determine the effectiveness of the components of the computer program. Methods: A longitudinal RCT was conducted over 12 months with 3 incremental levels of weight loss intensity. This study focuses on the computer intervention (N = 589). Participants had weekly access to the computer guided intervention (CGI) throughout the study. One component of the CGI was behavioral prescriptions, which were specific measurable exercise, dietary, and cognitive behavioral goals. The CGI prompted participants to select specific prescriptions at the end of every session. Each participant selected up to five prescriptions they planned to work on between sessions, and rated their success during the following session. Results: A significant correlation between final weight loss and CGI use was found (r = .26, P < .001). The average prescription success did not correlate with final weight loss (r = .045). Interestingly, participants’ weight loss readiness did not correlate with their final weight loss (r = .20). Conclusions: Despite the relationship between CGI usage and weight loss, both selection and success of behavioral goals were not found to be related to weight loss, indicating that other components of the CGI may be responsible. Further analyses will determine the relationship of stage of change with weight loss and behavioral prescription success. Evaluating the CGI components has important clinical applications, since identifying component effectiveness will guide accurate research and allow for successful weight loss interventions.

T451-P Improving the Satiating Potency of High Energy Beverages: From Concept to Real-World Application
Lucy Chambers, Keri McCrckerd, Martin R. Yeomans Brighton, United Kingdom

Background: Calories consumed as a beverage tend to have weak effects on appetite, perhaps because the satiating potency of a food is dependent not only on the physiological effects of its nutrients but also on the consumer’s experience of ingesting that food; the sensory experience of consuming liquid calories might result in the beverage being more relevant to thirst processes than to those that control appetite. In a series of studies we examined how manipulating a beverage’s sensory properties to make it more relevant to appetite control processes can change how consumers respond to the calories it contains, and whether any changes in response are robust over time and evident outside the laboratory. Methods: Participants (n = 48) repeatedly consumed a beverage which was either high (279kcal) or low in energy (78kcal) and which either had been thickened and made to taste more creamy or was presented without these sensory enhancements. These beverages were consumed as a mid-morning snack over a two month period. Consumers’ satiety responses were measured at pre-exposure, post-exposure and at 1 month follow-up. Results: The high calorie beverage with added thick and creamy sensory properties suppressed appetite to a greater extent than the same beverage without these sensory enhancements, replicating previous findings. However, after repeated consumption of the beverage the beneficial effects of the sensory manipulations became less apparent. Conclusions: Overall these data suggest that subtle sensory modifications of high energy beverages might aid appetite management, but whether these effects can have a positive impact on eating behaviour outside the laboratory remains to be seen. A fol-

measured. Treatment group was examined as a possible moderator. Results: 48.3% participants maintained WLS at 18-months [53.9% of HE condition; 42.8% of SB condition]. None of the pre-treatment behaviors were predictive of WLS in either condition. Infrequent self-weighing, although not associated with weight loss outcomes, was associated with eating meals away from home (r = .36, p < .01), and lower dietary restraint (r = -.22, p < .05). Less than half of all participants endorsed being the primary grocery shoppers (44.1% HE; 47.5% SB) or meal preparers (42.4% HE; 37.4% SB). Preparing less than half of all meals at home was associated with poor dietary restraint (r = .17, p < .05). Conclusions: Identifying pre-treatment predictors of weight loss success remains an elusive goal. Although our results did not find specific behaviors predictive of WLS, they do suggest that many individuals enter treatment with little control over the types of food that enter the home. Interventions that include the primary grocery shopper and/or meal preparer in treatment might yield greater weight losses over time.
low-up study will test these ideas in the real-world and a description of this methodology will be discussed.

T-452-P
Factors Associated with Treatment Success for Patients with Loss of Control Eating in a Behavioral Weight Loss Program
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Background: Binge eating has been associated with sub-optimal weight loss in lifestyle change programs. Reasons for this finding are unclear, although loss of control eating may contribute to lower treatment success via poorer behavioral adherence. The present study examined the relations among baseline binge eating with loss of control (LOC), dietary behaviors, hedonic hunger, and weight loss within a 15-week fee-for-service lifestyle change weight loss program incorporating meal replacement products. Methods: 111 adults (Mean BMI: 35.9±7.0, range: 24.6 – 60.1) completed the Power of Food Scale (PFSS), Eating Behavior Inventory (EBI), and binge eating screening questions from the Questionnaire of Eating and Weight Patterns before treatment, and repeated the PFSS and EBI at the end of treatment. Relations of LOC (present/absent last 6 months) to PFSS, EBI and % weight loss were examined. Results: LOC binging was reported by 24 (22%) of patients. Although nonsignificant, those with LOC tended to lose less weight than non-LOC patients (M=7.2 ± 4.2% vs. 8.8 ± 5.2%, respectively), t(108) = 1.74, p = .08. The effect of LOC eating on weight loss was at least partially mediated by higher baseline hedonic hunger (PFSS) and lower baseline usage of weight control behaviors (EBI). Correlations between improvements in weight control behavior usage and percent weight loss were stronger for LOC subjects than for non-LOC subjects (Total EBI Score z’ = 1.88, p<.05). Conclusions: To the extent that binge eaters do less well in weight loss programs, results suggest that higher hedonic hunger and lower use of weight control behaviors are contributors. If these results are replicated, a stronger focus on improving weight control behaviors may be particularly important for enhancing weight loss by patients with LOC eating.

T-453-POT
Preliminary Assessment of Engagement Throughout Pregnancy in an Online Appropriate Weight Gain and Healthy Lifestyle Intervention
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Background: While overweight/obese women generally use the internet more than normal weight women, little is known about their engagement in online weight and lifestyle interventions. This study aims to identify usage patterns of participants in an online pregnancy intervention to promote appropriate weight gain and examine usage patterns by BMI group. Methods: A racially and socioeconomically diverse cohort of pregnant women ages 18-35 were randomized to intervention arms that had access to a website with arti- cles, resources, blogs, BMI tailored weight gain tracker, and diet and physical activity goal-setting and monitoring (n=1112). Latent-class analysis was used to identify patterns of usage and multinomial logistic regression was used to examine associations with demographic characteristics. Results: Six distinct patterns of usage emerged: non-users (21%); minimal-users (33%); viewers (11%); and super-users (12%). The proportion of overweight/obese women was highest in the non-user (54%) and super-user (55%) groups. With super-users as the reference, women who are overweight/obese are less likely to be in the minimal (AOR=0.59, 95% CI=0.39.0.88), viewer only (AOR=0.46, 95% CI=0.28-0.73), and diet and physical activity goal-setters (AOR=0.60, 95% CI=0.36-0.99) groups than normal weight women. Women who are low-income, black, and younger are more likely to be in the non-user group compared to their counterparts. Conclusions: BMI group was a significant predictor of particular usage patterns of intervention features. Further examining emerging patterns of online intervention usage throughout pregnancy and differences by BMI group could provide helpful information for design and implementation of future interventions.

T-454-P
Does Implicit Attraction to High Calorie Foods Moderate the Relationship between Executive Function and BMI?
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Background: Recent theories of self-control (e.g., Hofmann, 2003) hypothe- size that certain neurocognitive processes, specifically executive functions (EF), are necessary for self-regulation in the context of appetitive stimuli, es- pecially when positive implicit attitudes (IA), for the stimuli are high. The current study sought to test the hypotheses that IF correlates negatively with body mass index (BMI) in an overweight sample, and that this association is moderated by IA for high-calorie food. Methods: We administered a neuropsy- chological battery and a measure of IA (Implicit Attitudes Test) to women (n=77; BMI > 27 kg/m2) being screened for behavioral weight loss intervention. Results: Results indicate that, controlling for age and IQ, working memory (p = .04, ηp = .06) and cognitive flexibility (p < .03, ηp = .06) negatively correlated with current BMI. IA significantly moderated the rela- tion between delay discounting and BMI, such that BMI was highest for those with high implicit liking of high-calorie foods and steeper discounting of delayed monetary reward (i.e., those who chose smaller immediate vs. larger delayed reward) (p < .01, ηp = .10). Effect sizes for other interaction effects were small (ηp=0.00-.04). Inconsistent moderation effects might be attributable to elevated implicit liking of high-calorie food in this overweight sample, reducing variance in IA scores. Conclusions: Our current findings indicate that higher BMI is associated with poorer working memory capacity and cognitive rigidity, and, when implicit liking of unhealthy food is high, ability to delay reward is reduced. Although temporal relations cannot be in- ferred from the current study, these factors may also represent etiological or maintenance factors for overweight and obesity.

T-455-P
Comparing Three Methods of Intervention Delivery within a Behavioral Weight Loss Program for Young Adults: A Randomized Controlled Pilot Study
Jessica G. LaRose, Autumn Lanoye, Megan Blumenthal Richmond, VA; Deborah F. Tate Chapel Hill, NC; Laura J. Caccavale Richmond, VA; Elissa Jelalian, Rena R. Wing Providence, RI

Background: Young adults (YA) are underrepresented in behavioral weight loss (BWL) trials and achieve poorer outcomes than older adults, yet few studies have targeted YA. This study examined the feasibility, acceptability and preliminary efficacy of 3 BWL programs with 18-25 year olds. Methods: Participants (N=52, 79% female, 54% minority, Age=22.3±2.0, BMI=34.2±5.4) were randomly assigned to 1 of 3 arms: face-to-face (F2F), web (W), or web plus (W+). All arms received a 12-week BWL program de- veloped based on our previous work. F2F received the program via weekly group sessions and brief bi-weekly individual sessions; W and W+ received a single group session followed by a web-based program. In addition, W+ was given the option of attending experiential groups offered through community partners (e.g., circuit training at a local fitness studio, cooking classes at a local cooking school). Anthropometric, clinical, and behavioral measures were assessed at 0, 12 and 24 weeks. Satisfaction was assessed at 12 weeks. Results: F2F participants attended 70% of sessions. Attendance was 100% at the single session in W and W+ arms. W and W+ participants viewed 30.2% and 56.5% of lessons and reported their weight on 45.6% and 73.6% of visits, respectively. W+ participants attended 23% of the optional experiential groups offered through community partners. The 12-week visits are on- going; to date 79% of participants have completed the visit (2 wks remain in visit window). Among completers to date, preliminary data indicate 30.8%, 33.3% and 66.7% of F2F, W and W+ participants achieved >5% weight loss. Participants in all arms reported high satisfaction with the program. All follow-up visits will be complete by September. Conclusions: Findings will be discussed in terms of viability of each of the approaches and implications for future BWL interventions with 18-25 year olds.
T-456-P
Mind Over Eating®: A Pilot Study Exploring Behavior Changes and Trends
Heather Javaheerian-Dayingt, Loma Linda, CA; Prudence Ticknor Las Vegas, NV
Background: The Mind Over Eating® program emphasizes mindfulness, mind body therapies, and cognitive behavioral techniques to support obese individuals who are planning bariatric surgery. The program covers areas such as food knowledge, food addiction, stress management, spirituality, and lifestyle modification to initiate changes in behavior and weight loss. The purpose of our study was to explore the effectiveness of Mind Over Eating® on overall lifestyle behaviors and weight loss. Methods: We conducted a retrospective study to determine the effectiveness of the 12-week preoperative Mind Over Eating® program. Pre and post questionnaire data were collected from 22 individuals who participated in the Mind Over Eating® program from January 2011 to July 13, 2011. Results: The mean weight at the start of the program was 323 lbs. (SD 71.76), with a final weight of 286 lbs (p=0.002, SD 56.8). Significant gains were found in the areas of improved nutritional knowledge, mindful eating, and participation in meaningful activities. Water intake increased (p=0.06) while soda intake decreased (p=0.01). Eating a protein source with each meal increased from 40.9% to 90.9% (p=0.001). Participants reported eating meals more slowly (p=0.015). Fast food intake decreased (p=0.005). At the end of the program participants reported a significant change in their participation in meaningful activities with all of the participants reporting that they engaged in a meaningful activity at least once a month (p=0.007). Conclusions: The Mind Over Eating® program showed positive trends in weight loss, nutritional knowledge, eating patterns and behavior, and participation in meaningful activities. Mind Over Eating®’s foundation in mind-body connection positions it as a valuable tool in assisting people struggling with obesity and increasing success for bariatric patients.

T-457-P
The Impact of Obesity Stigma on Health Behaviors among Treatment Seeking Adults
Jason Lillis, Rena R. Wing, Graham Thomas, Tricia M. Leahy, Jessica L. Unick, Kathleen E. Kendra Lillis, Amanda I. Samuel Providence, RI
Background: Obesity stigma is pervasive and can be debilitating, particularly when obese individuals come to believe and endorse negative stereotypes about themselves (referred to as internalized stigma or weight self-stigma). A recent study showed that exposure to a stigmatizing video led to increased calorie consumption among overweight women in a laboratory setting. However, little is known about how stigma impacts behaviors relevant to weight control, such as dietary choice and self-monitoring. Methods: One hundred and thirty weight loss treatment seeking adults (mean = 50 ± 10) with a BMI range of 30-51 (mean = 37.5) completed a battery of self-report and objective measures prior to entering treatment. Results: Weight self-stigma predicted poorer dietary choices and self-monitoring when controlling for BMI (F=4.32; p<0.01). In addition, weight self-stigma also predicted lower quality of life, higher anxiety and depression, and more difficulty coping with psychological symptoms. Conclusions: Weight self-stigma may play a role in poor health behaviors. Obese people who lose 10% of their body weight (as is typical in behavioral interventions) remain overweight or obese and will likely continue to experience exposure to stigmatization. This could lead to poor health behaviors which could result in weight regain. Future research should examine the longitudinal relationship between stigma and health behaviors and should also seek to identify ways to help obese individuals cope with self-stigma that also allow them to initiate or maintain healthy lifestyle changes.

T-458-P
Using Technology to Prevent Excessive Gestational Weight Gain in Low-Income, African-American Women: A Feasibility Study
Sharon J. Herrin Philadelphia, PA; Gary G. Bennett Durham, NC; Jane F. Cruce, Marisa Z. Rose, Gary D. Foster Philadelphia, PA
Background: Nearly 50% of all low-income, African-American women gain more weight in pregnancy than is recommended, placing them at risk for poor health outcomes. Few interventions have been studied to prevent excessive gestational weight gain among women in this population, and none have incorporated technology for skills training and adherence. Methods: In 2012-2013, 9 pregnant African Americans were recruited and enrolled in this weight-control feasibility study. At baseline, all participants were over the age of 18 (mean age 25 ± 5.6 years), low income (100% Medicaid), in early pregnancy (mean gestational age 13.3 weeks, range 8-19 weeks), and overweight (mean BMI 32.3 ± 5.9 kg/m2). Participants received a 14-week intervention that included: 2 face-to-face visits; 7 health coach counseling calls; daily skills and monitoring text messages that encouraged appropriate weight gain and healthy eating/exercise; automated text message feedback; individual web-based weight gain graphs; and a Facebook support group. Retention at follow up in the 3rd trimester was 100%. Results: Overall, the majority of women reported much satiety value, participants gained 6.1 ± 3.3 kg and 22% exceeded Institute of Medicine guidelines for gestational weight gain. Participants decreased intakes of soda (50% at baseline drank soda daily vs. 0% at follow up), fried food (78% at baseline consumed fried food at least weekly vs. 44% at follow up), and chips (56% at baseline ate chips at least 2-4 times weekly vs. 11% at follow up). Most found the intervention “extremely helpful” in controlling weight (78%) and improving eating (89%). Conclusions: These findings support the feasibility, acceptability, and initial efficacy of an electronically-mediated weight-control intervention for overweight, low-income, pregnant African Americans. A randomized controlled trial with extension postpartum will follow. Support: K23HL106231

T-459-P
Women’s Attitudes Toward a Pre-Conceptual Healthy Lifestyle Program
Kristine L. Funk, Erin S. LeBlanc, Kimberly K. Vesco, Victor J. Stevens Portland, OR
Background: Nearly half of U.S. women begin pregnancy overweight or obese, and more than half of overweight or obese pregnant women experience excessive gestational weight gain. Recently conducted lifestyle interventions have helped women avoid excessive weight gain during pregnancy, but helping women lose weight before pregnancy may be an even more effective way to improve pregnancy outcomes. This study was designed to determine women’s attitudes toward pre-pregnancy diet and weight management interventions. Methods: In May 2013 we conducted an anonymous survey of women in a health maintenance organization’s obstetrics and primary care waiting rooms. This survey focused on attitudes toward participating in a pre-conception lifestyle change program. Results: Eighty percent of the 126 women surveyed were pregnant or considering pregnancy within five years. Of the 60 respondents who were overweight or obese, 96% rated healthy diet and healthy weight before pregnancy as very important or important, and 77% expressed an interest in participating in a healthy lifestyle program (diet, weight management and physical activity) before becoming pregnant. Likewise, overweight or obese women reported being likely or highly likely to participate in specific intervention program aspects like keeping phone appointments (77%), using a program website (70%), keeping food and exercise records (63%). Conclusions: These results show that women in this population believe that adopting a healthy lifestyle and losing weight are important before pregnancy and that they are interested in programs that will help them achieve those goals in preparation for pregnancy.

T-460-P
Thinking About the Consequences of Consumption: How Expectations Can Change the Satiety Value of a Drink
Keri McCrickerd, Lucy Chambers, Martin R. Yeomans Brighton, United Kingdom
Background: Drinks are often reported to be less satiating than the same nutrients consumed as a ‘food’, such as soup, possibly because they are not experienced to have much satiety value. We hypothesised that nutrients consumed in thin drinks were either presented as a high energy (HE, 271kcal) and low energy (LE, 75kcal) version of a fruit drink, expected to have much satiety value. We incorporated expectation into the satiety value of a drink by manipulating for weight-related expectations. Participants received a thin and a thick drink, with no additional information. A fourth group of participants received a thickened version of the drink, with no additional information. Results: Ad libitum food intake was measured 60 minutes later. Results: Expected lower quality of life, higher anxiety and depression, and more difficulty coping with psychological symptoms. Conclusions: Weight thinking may play a role in poor health behaviors. Obese people who lose 10% of their body weight (as is typical in behavioral interventions) remain overweight or obese and will likely continue to experience exposure to stigmatization. This could lead to poor health behaviors which could result in weight regain. Future research should examine the longitudinal relationship between stigma and health behaviors and should also seek to identify ways to help obese individuals cope with self-stigma that also allow them to initiate or maintain healthy lifestyle changes.
a similar amount at lunch after the HE drink compared to LE, compensating for just 9% of the extra energy in the HE drink. Explicit beliefs about the drink being ‘thirst-quenching’ and ‘filling’ increased energy compensation (29% and 41% respectively), but participants compensated the most when the drink was thicker (75%). However, increased compensation was primarily due to participants consuming more at lunch after the LE drink, rather than less after the HE version. Conclusions: These data suggest that anticipating a drink will be satiating can modify it’s satiety value. However, these expectations may actually reduce the satiety value of a product if they are not in-line with it’s actual nutrient content. This has important implications for the design of reduced energy items which could promote overconsumption.

T-461-P
Measuring Diet Adherence During a 6-Month Weight Loss Program: Self-Report Versus a Mathematical Model of Human Metabolism
Arjun Sanghvi Bethesda, MD; Miguel A. Rojo-Tirado, Pedro J. Benito Madrid, Spain; Kevin D. Hall Bethesda, MD

Background: Adherence to a prescribed diet is the primary determinant of a successful weight loss intervention. Unfortunately, measuring diet adherence is difficult since self-reported food intake is highly inaccurate. In contrast, accurate methods of quantifying free-living energy intake (EI), such as repeated doubly labeled water dosing and DXA scans, are prohibitively expensive. Thus, an accurate and inexpensive alternative for quantifying diet adherence is urgently needed. Methods: Self-reported EI changes were measured using food logs from the PRONAF study (Zapico, BMC Public Health 2012) where 17 overweight and 22 obese subjects were prescribed a 6-month 25-30% calorie restricted diet based on individual energy requirements at baseline. Body weight was measured every 2 weeks throughout the intervention and these data were used as inputs to a mathematical model of human metabolism to quantify the EI changes underlying the observed body weight time courses. Results: The intervention resulted in an average weight loss of 8.2±5 kg (p<0.001). The self-reported EI change was -100±510 kcal/d which was not significantly different from the prescribed -999±265 kcal/d (p=0.356). Thus, the self-reported diet adherence was 105±36%. In contrast, the mathematical model calculated an EI change of -647±381 kcal/d which was significantly different from both the food logs (p<0.001) and the prescribed diet (p<0.001 ) and corresponded to a diet adherence of only 67±40%. Conclusions: Mathematical model calculations of EI change from repeated body weight measurements offer a convenient and inexpensive quantification of diet adherence during a weight loss intervention that is more accurate than self-reports.

T-462-P
Improvement in Provider and Patient Self-Efficacy in Weight Loss in Primary Care
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Background: Motivation type, risk perception (RP), and self-efficacy (SE) can predict weight loss success. Enrollment data from a 6-month clinic-based healthy lifestyle intervention was assessed aiming to improve patient weight outcomes and patient and provider (PCP) self-efficacy in obesity. Methods: Qualitative survey with questions from the Weight Loss Treatment Self-Regulation, Weight Efficacy Lifestyle, and Health Care Climate Questionnaires; the Perceived Competence Scale; on weight loss SE and RP, medical history, anthropometrics, and demographic data. Results: Patients were (n=46 to date) 64% female, 84% white, mean age 50.8 (SD 11.5), mean BMI 42.2 (SD 9.2), mean waist circumference female=48.2 inches (SD 7.3) and male=50.5 (SD 3.95), mean LDL 103 (SD 35.4), mean FBG 137 (SD 67). Mean autonomous motivation (AM) was 5.74 (SD 1.18), controlled motivation (CM) 2.35 (SD 1.07), diet self-efficacy (SE) 4.86 (SD 1.11), perception of obesity susceptibility 3.62 (SD 1.42), and perception of obesity severity 4.78 (SD 1.22 [ranges 1 (low) to 7 (high)]. There was a positive correlation (PC) between SE and AM (r=0.56), a small PC between SE and CM (r=0.04), and a small negative correlation (NC) between SE and perceived obesity susceptibility (r=-0.12) and perceived severity of obesity (r=-0.18). Conclusions: We found higher levels of AM than CM, moderate levels of SE, generally low perceived obesity susceptibility, and moderate perceived obesity severity. Patients with higher SE reported lower perceived obesity susceptibility and perceived obesity severity. Future goals include linking SE and risk perception and targeting specific risk factors for poor lifestyle choices, and interpreting PC data.

T-463-P
Internet-Based Self-Help and Cognitive-Behavioral Therapy in the Treatment of Binge Eating Disorder (INTERBED): A Multicenter Randomized Trial
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Background: Internet-based guided self-help based on cognitive-behavioral principles (GSH-I) may be efficacious in the treatment of binge eating disorder (BED), but efficacy in comparison to cognitive-behavioral therapy (CBT) awaits clarification. Methods: This report of baseline characteristics and adherence is based on a multicenter randomized non-inferiority trial of GSH-I vs. CBT. A total of 178 individuals with BED (DSM-IV-TR or sub-syndromal) and body mass index between 27-40 kg/m2 were randomized to 4-month GSH-I or individual CBT. Primary outcome (days with objective binge eating over the past 28 days) and secondary psychosocial outcomes were assessed at baseline, mid and end of treatment, and 6- and 18-month follow-up. Results: Patients were mostly middle-aged obese women suffering from full-syndrome BED (88.8%) at long duration. Compared to norms, patients had increased rates of affective and anxiety disorders, increased eating disorder and general psychopathology, and lowered self-esteem and quality of life. Patient treatment expectations were positive, and attention by the end of treatment (4.5%) was low. Therapist adherence to GSH-I and CBT was documented. Conclusions: These results show that patients with long-standing and severe psychopathology sought treatment through either GSH-I or CBT. Both treatments were acceptable and could be conducted in a manual-conform way. Future analyses will compare the efficacy of GSH-I vs. CBT in the long-term, and address identification of moderators and mediators.

T-464-P
Individual Differences in Physical Activity and Weight Loss within a Behavioral Weight Loss Program
Stephanie G. Kerrigan, Meghan L. Butryn, Evan M. Forman Philadelphia, PA

Background: An understanding of individual differences in response to behavioral modification programs is critical for improving outcomes. While some research has shown differential responses to behavioral weight loss (WL) programs and physical activity (PA) adoption between sex and racial categories, objective measurement of PA in this research is lacking. Methods: Overweight/obese participants (n = 174) enrolling in a 12-month behavioral WL treatment wore an Actigraph GT3X+ accelerometer for 7 days at baseline, mid- and post-treatment. PA outcome was minutes spent in moderate-to-vigorous bouts of activity (MVPA). Results: At baseline, MVPA was higher (p < .01) in men (n = 47, M = 89.86) than women (n = 127, M = 36.46). Gender moderated the adoption of MVPA (p = .01; η² = .13). Six months into treatment, women had increased activity (M = 128.58) and maintained at post-treatment (M = 112.83), while men did not change during treatment (M = 77.09 and 82.11 at 6 and 12 months). Percent WL at 6- and 12-months were similar (p = .34 and p = .27). White participants (n = 126) did not differ from participants of a racial minority (n = 47) in MVPA at baseline (p = .99) and racial status did not moderate PA adoption (p = .41; η² = .03). However, white participants had higher percent WL than non-white participants at 6 (M = -11.46% vs. M = -7.61%; p < .01, η² = .07) and 12 (M = -13.31% vs. M = -8.89%; p = .01, η² = .07) months. Conclusions: Given the same PA prescription, women appear to be better able to adopt MVPA than do men, though WL is similar. While white and non-white participants have similar increases in MVPA, WL does not reflect this change. A better understanding of the mechanisms by which different people adopt PA, and the relationship between PA and WL in different subgroups, is needed to better target adoption and maintenance of PA during WL and maintenance.
T-466-P
Decision-Making Impairment Predicts Weight-Loss Outcome
Alyssa J. Matteucci, Laura A. Berner, Stephanie G. Kerrigan, Evan M. Forman, Meghan L. Butryn Philadelphia, PA

Background: Prior research indicates that obese individuals demonstrate a high preference for immediate reward, despite higher future losses in terms of both physical and psychological outcomes. Deficits in decision-making abilities and assessment and consideration of future consequences may represent key elements of the neurocognitive profile of obese individuals that promote or maintain weight gain. Methods: The present study used a standardized neuropsychological test, the Iowa Gambling Task (IGT), to assess the decision-making profile of an obese sample (N=42) enrolled in two behavioral weight loss treatments. Participants were randomly assigned to standard behavioral treatment (BWL; n = 23) or behavioral treatment with an environmental-change focus (BWL-E; n = 19). BWL-E was designed to promote changes in food cues and availability, as well as cues for exercise, so that desirable weight control behaviors would become defaults and participants would need to rely less on self-control. Results: IGT score moderated treatment effects on weight loss such that those with poor IGT scores lost more weight after 6 months in BWL-E than in BWL (p < .01, partial eta squared = .16). Conclusions: These results suggest that a BWL treatment focused on environmental stimulus control, which minimizes the frequency of decision-making between immediate rewards and longer-term healthier choices, may be preferable for obese individuals with poorer decision-making skills.

T-466-P
The Effect of Distress Tolerance on Physical Activity in an Overweight/Obese Sample
Stephanie G. Kerrigan, Stephanie M. Manasse, Evan M. Forman, Meghan L. Butryn Philadelphia, PA

Background: High levels of moderate-to-vigorous physical activity (MVPA) are critical for long-term weight control, however, most individuals engage in insufficient levels of PA. Poor adherence to PA goals may be related to an inability to tolerate physical discomfort associated with MVPA. The aim of this study was to evaluate the relationship between objectively-measured physical distress tolerance (PDT) and PA in an overweight sample. Because research suggests that PA differs by gender, we examined these relationships in each gender separately. Methods: Overweight/obese participants (n = 78; projected n = 130) enrolling in a weight loss study were asked to wear an Actigraph GT3X+ accelerometer for 7 days. PDT was assessed by time participants kept their hand immersed in a cold pressor (a circulating water bath kept at 3 degrees Celsius). Results: After controlling for BMI, PDT predicted minutes and week in MVPA (p = .04, n2 = .06). Men were more distress tolerant than women (p = .01, n2 = .07), but MVPA did not differ between genders (p = .16, n2 = .03). The sample was divided by gender for the remaining analyses given differences in PDT. In men (n = 12), PDT was very strongly associated with higher daily energy expenditure (p = .03; r = .64), time spent in MV activity (p = .01; r = .76). BMI was unrelated to PDT or PA in men. PDT did not predict MVPA in women (n = 66; p = .23, n2 = .02), but, controlling for BMI, PDT (p = .06, n2 = .06) did predict weekly time in sedentary activity. Conclusions: This is the first study to examine the relationship between PA and PDT using objective measures. Overall, PDT appears to be related to level of PA, however, this relationship appears to be stronger in men. Potential implications include targeting PDT in weight loss maintenance and PA adoption programs, particularly for men.

T-467-P
Age and Gender Effect on the Short-Term Weight Loss and Long-Term Weight Maintenance
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Background: Age and gender may influence responses to medically-supervised weight loss programs. We sought to determine if age or gender are associated with differences in short- and long-term weight loss and weight maintenance success. Methods: A retrospective review was conducted of patients enrolled in a Midwestern weight loss clinic between 2003 and 2011. Inclusion criteria were: (1) BMI ≥ 25 kg/m2 (2) completion of a minimum of three months of weight loss using Health Management Resource’s (HMR) meal replacements, and (3) age 18 years or older. Results: A total of 2054 participants were identified for the study. A majority of the participants were female and Caucasian. At three months, 72.3% (n=1,484) achieved a 10% initial body weight loss (IBWL). Participants aged 18–45 years were more likely to achieve three month weight loss compared to participants aged 45-64 or ≥ 65 years. However, age was not a significant predictor for 12 month weight maintenance success (defined as maintaining a >10% IBWL). Women were less likely than men (OR=0.47, 95% CI 0.38, 0.59) to achieve three month weight loss but more likely (OR=1.94, 95% CI 1.02, 3.67) to achieve 12 month weight maintenance. Conclusions: Age < 45 was a significant predictor of weight loss at three months, but was not a significant predictor of 12 month weight maintenance. Females were less likely than males to achieve weight loss at three months but more likely to maintain weight loss at 12 months.

T-468-P
Increasing Physical Activity Through Walking, Bicycling and Gardening
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Background: Physical activity (PA) has known benefits and should be encouraged. The aim of this study was to evaluate the short-term effects of walking, bicycling, and community gardening approaches to enhancing PA among urban-dwelling older adults and low-income ethnic minorities. Methods: 157 adults of all races/ethnicities self-selected into one of three interventions: walking (n = 47), bicycling (n = 35), or gardening (n = 75). Interventions were 10 weeks long, with follow-up data collection every 3 months until 1 year. Data collected included: self-report questionnaires, measured PA, and PA focus groups. Results: After intervention and at 9-months, three differences in data arose. Bicyclists showed a significant increase (p < 0.01) in social networks from pre- to post-intervention, and at 9-month data collection, as well as a significant improvement (p < .001) in perceived environmental attributes, as well as an increase in duration, frequency, and distance of bicycling. PA focus groups revealed the following themes: meeting new people, a spirit of community, accountability, increasing exercise, and developing community awareness. Conclusions: Although only bicyclists showed significant changes, other important data did emerge. Gardening was the most successful intervention, with a greater percentage of individuals who wanted to participate, completed data collection, and continued to garden after the study. Once the intervention period was completed, walkers showed a lack of sustainability among individual participants. Despite few statistically significant findings, the results should be considered in their entirety. Participant verbal comments and feedback throughout the study, in addition to during focus groups, reflected the positive impacts that these interventions had upon the participants’ lives.

T-469-P
Habituation and Repeated Orosensory Exposure Via the Olfactory and Gustatory Systems
Kate Benson, Hollie Raynor Knoxville, TN

Background: Greater exposure to an orosensory cue could increase habituation, producing more rapid satiation. Exposure can occur via olfactory and gustatory systems and repeated exposure through both systems may increase habituation. This investigation examined salivary habituation during 10 lemon juice trials providing exposure via olfactory, gustatory, and combined systems. Methods: Healthy, normal-weight, unstreamed females (20.7 +/- 2.7 yrs, 22.2 +/- 1.5 kg/m2, 63.0% white) were randomly assigned to 1 of 3 conditions: olfactory (SMELL: n = 8), gustatory (TASTE: n = 10), or olfactory + gustatory (SMELL + TASTE: n = 9). All conditions completed 12, 2-minute, trials (trials 1-2: water [baseline]; trials 3-12: lemon juice). In conditions with taste exposure, 0.05 ml of the stimulus was placed on the tongue. In conditions with smell exposure, 4.0 g of the stimulus was held 0.5 in from the nose. Participants were instructed to not swallow during trials. Trial salivation was measured using dental rolls and mean salivation of every two trials was the dependent variable. Results: A mixed-factor ANOVA; controlling for baseline lemon juice hedonics, found a significant (p < 0.05) interaction of condition x trial. SMELL + TASTE significantly (p < 0.05) increased salivation from baseline (trials 1 & 2) to lemon juice (trials 3 & 4, 5 & 6, and 7 & 8), and decreased salivation by trials 9 & 10, and 11 & 12, which was not significantly different from baseline. TASTE had a significant (p < 0.05) increase in salivation from baseline to lemon juice, with no de-
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**T-470-P**

Complementary and Alternative Medicine Use and Disclosure to Physicians: Do Obese Patients Differ from Non-Obese Patients?

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**Background:** Complementary and alternative medicine (CAM) use is growing but may be less common among obese patients. Nondisclosure of CAM use to providers is frequent and possibly risky, but it is not known whether obese CAM users are more or less likely to discuss with their doctors

**Methods:** Using baseline survey and electronic medical record data from 845 HMO members eligible for an RCT of a medication (statin, ACE-I, ARB) adherence intervention, we studied the cross-sectional relationship between BMI category (obese vs. not) and odds of reported use of 3 CAM categories (Products (e.g. supplements), Providers (e.g. massage), and Practices (e.g. yoga)). Among CAM users, we then examined whether the odds of discussing CAM use with a provider differed by BMI category using multivariable (MV) logistic regression, adjusting for age, sex, race/ethnicity, and education

**Results:** Compared to non-obese respondents (n=364), obese (n=481) were younger (mean 42.2y(SD10.3), vs. 69.3y(11.1)), more likely female (59.9% vs. 44%), non-Caucasian (65% white vs. 69.5%), and with equal educational level (60% vs. 61% asion college). In MV models, odds of CAM Product use were lower for obese patients (OR 0.71 (95%CI: 0.50-0.99)), while there was no difference in the odds for other CAM modalities (Provider: 0.75 (0.50-1.10), Practices: 1.02(0.64-1.66)). Among CAM users, obese patients were equally likely to have discussed their use of products and practices with their doctors (Product MV OR 1.06 (0.67-1.67)), Practices crude OR 0.80(0.34-1.87), but more likely to have discussed their use of provider-based CAM therapy (MV OR 3.53(1.66-7.85))

**Conclusions:** Obese patients were less likely to report some forms of CAM use than non-obese patients, but, among users, were actually more likely to have discussed their practices with providers, perhaps in context of discussions about weight loss.

**T-471-P**

Effect of a Small-Changes Approach for Weight Loss: A Randomized Controlled Trial

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**Background:** Little research has been done on promoting weight loss in predominantly male populations with high prevalence of comorbidities. Moreover, there is currently a debate about whether small changes is a viable obesity treatment option. Our objective was to test whether a small-changes intervention (ASPIRE), delivered in a group or via telephone, promoted greater weight loss than a conventional weight management program.

**Methods:** This trial enrolled and randomized 481 overweight or obese subjects between 2010 and 2011 to three parallel arms, stratified by two study sites. The two ASPIRE arms were delivered by coaches via in-person groups (ASPIRE-Group) or via one-on-one phone sessions (ASPIRE-Phone). Clinical medical center staff delivered the conventional program. Weight changes at 3 and 12 months were compared across the three arms by linear mixed-effects models.

**Results:** Overall, 85% of subjects were male, 43% were Non-Caucasian, the mean BMI was 36.5 (25.2-63.0), and mean age was 55 (23 to 87). Subjects in all three arms lost significant (p<.01) weight at 12 months compared to baseline. However, subjects in the ASPIRE-Group arm lost significantly more weight at 12 months than those in the other two treatment arms (a mean of -2.8 kg [95% CI, -3.8 to -1.9] in ASPIRE-Group arm versus -1.4 kg [-2.4 to -0.5] in the ASPIRE-Phone arm and -1.4 kg [-2.3 to -0.4] in the conventional arm)

**Conclusions:** A group-based, small-changes weight management intervention delivered by non-clinician coaches resulted in greater weight loss over 12 months compared to a telephone or conventional program in a predominantly male population with a high burden of comorbidities.

**T-472-P**

Perceptions of Social Support for Healthy Eating and Exercise among Males Seeking Behavioral Weight Control

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**Background:** Men are underrepresented in research and clinical settings involving behavioral weight management. This preliminary analysis of adult males examined perceptions of social support for weight control and associations with weight-related constructs. This area is understudied in men and may be relevant in understanding treatment-seeking behavior.

**Methods:** Participants were men (M age = 52.7 yrs; 95% white, non-hispanic) who completed a 4-week residential obesity program. Pretreatment health and weight measurements and self-report questionnaires were collected (Impact of Weight on Quality of Life–Lite, Eating Inventory–Disinhibition Scale, Social Support Scales). Analyses were limited to bivariate correlations given the exploratory study and modest sample size.

**Results:** Average BMI was 44.6; higher BMI was associated with lower weight-related quality of life (r = -0.60, p<.001). BMI was not correlated with Social Support or Eating Disinhibition. Higher scores for Social Support–Eating were correlated with greater eating disinhibition (r = -0.40, p<.01), triglycerides (r = -3.6, p<.01) and glucose (r = -28, p<.05). Social Support–Exercise was positively associated with overall and sexual quality of life (r's = .28 and .27, p's<.05).

**Conclusions:** Perceptions of support for weight loss may offer information about males’ reluctance to participate in behavioral treatment. Results revealed significant associations between perceived social support for healthy eating with increased eating disinhibition and higher triglycerides and glucose. Support for healthy eating may be experienced in a negative way (controlling or intrusive) and lead to unintended consequences such as overeating with resulting health effects. The cross-sectional, correlational nature of the study limits causal conclusions but suggests further examination of weight-related social support among males.

**T-473-P**

Randomized Controlled Trial of text4baby: Maternal Obesity Risk Factors and Weight Management Outcomes

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**Background:** Supported by the Telemedicine and Advanced Technology Research Center (TATRC), investigators from The George Washington University and Madigan Army Medical Center designed and implemented an RCT to evaluate the text4baby program (text4baby.org). Primary study questions were What effects do the messages have on: a) health knowledge, attitudes, beliefs, and social norms; b) maternal and child health outcomes? Additionally, given recent gestational weight gain guidelines, these amounts and weight related health behaviors were also examined.

**Methods:** The study is a randomized prospective design in which pregnant women receive text4baby plus usual care or usual care alone. At baseline, we recruited pregnant women presenting for prenatal care at Madigan. We followed participants through their first post-partum appointment. Baseline data were collected from 943 women, with follow up data collection ongoing. The evaluation protocol examined: 1) self-reported health behaviors targeted by text4baby; and 2) clinical outcomes from patient records. **Results:** We examined pregnant and postpartum women’s weight status and initial results from the RCT. Initial findings: statistically significant increases (p < .05) in daily fruit & vegetable consumption and seeking health information online. Participants gained an average of 16.3 kg during pregnancy. Following completion of the full sample, we will report on differences in weight outcomes between the treatment and control groups during the study period.

**Conclusions:** These findings and preliminary data from the trial will be put in context related to other studies. Implications of text4baby for future post-partum weight control programs and recommendations for future research will be covered.

**T-474-P**

Biopsychosocial Approach to the Treatment of Obesity: A Retrospective Review

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**Background:** The increasing prevalence of overweight and obesity needs effective approaches for weight loss. Weight loss treatments include weight-loss medications along with nutritional education and exercise, behavioral strategies aimed at lifestyle modifications, or nutritionally restrictive dieting.
Our purpose was to see if a more comprehensive, “Biopsychosocial” program that integrates the biological, psychological and behavioral issues, will help patients lose weight. Methods: The “Biopsychosocial” program was used to help patients lose weight at a weight loss clinic. The program teaches the role of insulin in weight loss, uses appetite suppressants to reduce cravings, implements cognitive behavioral therapy to reframe thinking, and utilizes behavioral therapy to break old eating habits through six visits. From 2011-2013, patients who completed at least 8 weeks of treatment were retrospectively reviewed and analyzed. Data included demographics, duration of treatment, medications, weight and BMI. Results: Participants lost an average of 23 pounds, or 11% from the initial weight (p<0.05) over an average of 97 days of treatment. Conclusions: The “Biopsychosocial” program is an effective weight loss method that addresses biological, psychological and behavioral issues. Further prospective study is needed.

T-475-P
Mindful Awareness Training Versus Computer-Based Inhibitory Control-Training for Decreasing Hedonically Consumed Foods in Overweight and Obese Adults

Background: Obesity is largely attributable to excess caloric intake in particular from low-nutrition discretionary ("junk") foods, including salty snack foods (SSF). Evidence suggests that hard-wired preferences translate (via implicit processes) into poor eating choices, unless hard-wired appetitive mechanisms. Recent work suggests that enhancing mindful awareness of the automatic processes that drive hedonic eating facilitates conscious restraint/inhibitory mechanisms. An exciting new group of studies suggests that computer-based training of inhibitory mechanisms can successfully modify real-world eating decisions. Methods: Healthy weight and overweight individuals who reported consuming SSF ≥4 days/week, and who actively desired to reduce their SSF consumption were randomized to one of four 75-minute interventions: computer-based inhibitory control training (ICT), mindful awareness training (MT), both ICT and MT (ICT+MT) or psychoeducation. For 7 days prior to the intervention, and for 7 days subsequent to the intervention, participants made 3 ratings per day of SSF consumption using a smartphone-based ecological momentary assessment system. Results: ANCOVA results (n=96, data collection ongoing) indicate large effects of condition on SSF consumption (F(3,80) = 3.26, p = .03, ηp2 = .11), and specifically that both MT and ICT+MT produced the largest decrease in SSF consumption (p<.04, p < .01), with a trend towards ICT+MT consuming the fewest (particularly in the shorter-term). Conclusions: These results strongly support the efficacy of mindful awareness training in decreasing hedonically-motivated eating, and to some extent, the efficacy of a computer-based inhibitory control training when synergistically combined with mindful awareness training.

T-476-P
Virtual Communities for Weight Management: A Systematic Review

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Background: Virtual communities – web-based environments through which people can give and receive peer social support - are an increasingly popular channel for weight management interventions. The efficacy of virtual communities for weight management has not yet been reviewed. Methods: We systematically reviewed the efficacy of virtual communities for weight loss or maintenance among overweight and obese adults. We also examined how participant engagement in these interventions varied as a function of study features and design, as well as the extent to which investigators have examined associations between engagement and weight loss outcomes. We searched 7 databases for randomized controlled trials evaluating the outcomes of weight management interventions, and for which a virtual community was the primary mode of intervention delivery. Our primary outcome was weight change. Results: From a total of 6261 papers, 9 studies met the criteria for inclusion. We found that most virtual communities were equally efficacious in promoting weight change as compared to the control arms, most of which were standard in-person group therapies for weight management. Effect sizes were small to moderate across trials. The clinical significance of weight change in these trials is undetermined, as these figures were not reported. We were unable to make conclusions about the associations between study features and engagement, due to the heterogeneity in the reporting of engagement metrics. Conclusions: We found that weight change produced through participation in virtual communities was not significantly different from that found in traditional group therapy interventions. These findings suggest that virtual communities may be an efficacious and potentially cost effective alternative to group therapy for weight management.

T-477-P
Success of Medicare’s Intensive Behavioral Therapy for Obesity in a Small Clinic Setting: A Retrospective Chart Review

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Background: Obesity is a fast growing epidemic in the United States. Within the Medicare population, over 30% of men and women are obese. The strong association between obesity and many chronic conditions, including cardiovascular disease and diabetes, highlights the need for intervention and preventative care in this population. Under the Affordable Care Act, the Centers for Medicare and Medicaid Services were authorized to add coverage for “additional preventative services,” including Intensive Behavioral Therapy (IBT) for Obesity for Medicare eligible individuals with a BMI ≥ 30 kg/m2. Medicare’s IBT for Obesity can be an effective tool for weight loss. Methods: A retrospective chart review was performed averaging the progress of twelve patients seen by a physician assistant under the Medicare IBT for Obesity program. Results: Results revealed that after an average of 8.5 visits, the total body weight, or percent body weight lost was 5.29% of original body weight. Waist measurements decreased by 0.83 inches and body mass index decreased by 3.7%. Both systolic and diastolic blood pressure readings decreased by 1.5% and 3.8% respectively. Conclusions: These results illustrate that an in-office, behavior focused program can be effective for weight loss. The success of programs such as Medicare’s IBT for Obesity will depend largely on patient and provider awareness of program existence, cost to patient, quality of education provided, and patients’ willingness to change. If utilized to its full potential, this program can impact not only patient health, but future healthcare costs.

T-478-P
Addition of Voluntary Beverage Service Offering Enhanced the Efficacy of Web-Based Self-Care Lifestyle Modification Program for Weight Loss

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Background: The objective of this study was to examine the efficacy of a web-based self-care lifestyle modification program (The Qupio(TM) Program) for weight loss in T2DM, overweight, and obese adults and to determine if adding a voluntary beverage service changed engagement or weight loss. Methods: Two-hundred twenty participants (male = 41, female = 179, with diabetes = 93, without diabetes= 127, mean BMI kcal= 34.8±8.1 kg/m2, mean age(ex(SD) = 51±13 years) enrolled in the program for 6 months. Goals for the user by the end of the program were weight loss of 7% of their starting body weight and a total of 150 minutes a week of physical activity. At entry into the study, diet and physical activity goals were set and meal plans and exercise routines were recommended for each participant to help them achieve calorie balance. Participants recorded their diet, activity, and body weight on the web-based tracking system. Tracked records were reviewed automatically by the application every 4 weeks and new goal and exercise recommendations were automatically generated. Participants voluntarily chose packaged beverages (coffee or green tea) to consume over the course of a 12-week period. A total of 31.4% (69/220) of the participants volunteered for the beverage service. Results: As a result, participants in the voluntary beverage subgroup showed significantly higher login frequency compared to the non-beverage subgroup (1.01 times/week vs. 0.29 times/week, p<0.01) and achieved greater weight loss (2.28±0.50% vs. 0.92±0.21%, p<0.01). Conclusions: In conclusion, participation programs for users such as a voluntary beverage service may enhance user access rates and weight loss in web-based self-care programs and facilitate lifestyle modification for the weight loss.

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T-479-P
The Relationship between Diet Cheat Days and Weight Plateaus
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Background: Clinical weight loss in individuals typically stabilizes at six months; however, validated thermodynamic energy balance models consistently predict weight plateaus between 1 and 2 years. Methods: We developed two thermodynamically based energy balance models to investigate this discrepancy. The first model predicted weight loss in long-term calorically restricted confined Rhesus monkeys that were fed measured amounts of food and weighed on a regular basis. The second model allowed for hypothetically based behavioral fluctuations in adherence to dietary prescriptions during weight loss. Results: The Rhesus monkey model predictions compared well with actual data and matched the timing of weight plateau between 1-2 years. Additionally, the model which included changes in dietary adherence generated realistic fluctuating weight graphs which matched well to actual subject weight loss observed in previous studies. Moreover, it was found that both the time point of the weight loss plateau and the value of the plateau were affected by intermittent loss of adherence to prescribed energy intake. It was found that a 6 month weight loss plateau can be generated even if an individual adheres to dietary prescriptions the majority of the time. Conclusions: The early weight loss plateau in experimental human studies is the result of intermittent loss of dietary adherence. Since most weight loss experiments observe a 6 month plateau, intermittent loss of dietary adherence is likely a natural response to caloric reduction and should be accounted for in model predictions.

T-481-P
The Comparison of a Technology-Based System and In-Person Behavioral Weight Loss Intervention in the Severely Obese
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Background: Technology-based systems incorporating a physical activity monitor and web interface to monitor dietary intake and weight combined with monthly telephone contact has been shown to be an effective intervention for weight loss. Whether this type of intervention is effective for individuals with Class II (BMI = 35.0 to <40.0 kg/m2) or III (BMI ≥40 kg/m2) obesity has not been examined. Moreover, continuous enhancements in technology require ongoing evaluation of the effectiveness of these interventions. Methods: 39 adults (age: 39.9±9.7, BMI: 39.5±2.8 kg/m2) were randomized to BWLI (N=14), TECH (N=12), or EN-TECH (N=13). Subjects decreased energy intake (1500-2100 kcal/d), and increased physical activity (200 min/wk). BWLI attended weekly group sessions. TECH was provided with a wearable activity monitor that interfaced with a web-based program, and received one 10-minute telephone call per month. EN-TECH received the same components as TECH, with enhanced Bluetooth capability for real-time monitoring of energy balance. Results: Weight was significantly reduced from 110.9±9.1 to 105.9±9.1 kg in BWLI (-5.0±6.2 kg, p<.001), 112.2±10.5 to 107.9±11.6 in TECH (-4.3±4.7 kg, p<.001), and 111.6±15.0 to 107.5±17.0 in EN-TECH (-4.1±6.1 kg, p<.001) from 0 to 6 months. However, weight loss was not significantly different between the intervention groups. Conclusions: Findings suggest that short-term weight loss can be achieved in individuals with Class II or III obesity with less in-person contact using a technology-based system with periodic telephone contact. Findings may have clinical implications for delivery of weight loss interventions for severely obese adults. Long-term effectiveness of a technology-based intervention warrants further investigation.

T-482-P
Effects of Visceral Adipose Tissue Reduction on Cardiovascular Risk Factors Independent of Weight Loss: The Look AHEAD Study
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Background: To determine whether visceral adipose tissue (VAT) reduction improves cardiovascular disease (CVD) risk factors, independent of the amount of weight loss. Methods: We analyzed data from 100 participants of the Fatty Liver Ancillary Study of Look AHEAD (Action for Health in Diabetes), who completed magnetic resonance imaging at baseline and 12 months, and had no missing data in the variables of interest. In the Look AHEAD, participants were randomly assigned to an intensive lifestyle intervention (ILI) which combined diet and physical activity or a control group who received diabetes support and education (DSE). We used multivariable regression models to correlate changes in VAT and CVD risk factors, while adjusting for weight-loss and treatment arm (ILI vs. DSE). Results: Overall 52% were women, 36% were black, mean age was 61 years. In the DSE arm, mean weight and VAT increased 0.1% (p=0.90) and 4.3% (p=0.39), respectively, over one year. In the ILI arm, mean weight and VAT decreased by 6.1 kg, p<.001) from 0 to 6 months. However, weight loss was not significantly different between the intervention groups. Conclusions: Findings suggest that short-term weight loss can be achieved in individuals with Class II or III obesity with less in-person contact using a technology-based system with periodic telephone contact. Findings may have clinical implications for delivery of weight loss interventions for severely obese adults. Long-term effectiveness of a technology-based intervention warrants further investigation.

OBESITY 2013 ABSTRACT BOOK
POSTER ABSTRACTS – WEDNESDAY, NOVEMBER 13 to FRIDAY, NOVEMBER 15, 2013
T-483-P
Increased Fruit and Vegetable Intake Has No Discernible Effect on Weight Loss: A Systematic Review and Meta-Analysis
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Birmingham, AL; Richard D. Mattes West Lafayette, IN; David B. Allison 
Birmingham, AL.

Background: A common dietary recommendation for weight loss is to eat more fruits and vegetables (F/V). Without a compensatory reduction in the intake of total energy, significant weight loss would be unlikely. Our objective was to synthesize the best available evidence on the effectiveness of being assigned to eat more F/V for weight loss or prevention of weight gain.

Methods: We searched multiple databases for randomized controlled trials (RCTs) where the singular effect of F/V intake was evaluated for effects on body weight/composition. Inclusion criteria: N per arm ≥ 15; duration of intervention ≥ 8 weeks; stated primary or secondary outcome variable is body weight/composition; stated goal of the intervention is weight/fat loss or prevention of weight/fat gain; intervention includes a variety of F/V that remain minimally processed; and was published prior to August 1, 2012. Results: Five RCTs met all criteria, but only three reported usable weight data; seven other RCTs met all criteria except for having weight as a primary outcome, but only three reported usable weight data. Preliminary analysis indicates a standardized effect (positive estimates indicate increased weight as a result of F/V consumption) for RCTs meeting all criteria was -0.24 (95% CI -0.56 to 0.08), p = 0.14. The standardized effect of increased F/V intake on body weight for RCTs meeting all most criteria was -0.02 (95% CI -0.14 to 0.11), p = 0.80. The six RCTs for which weight data was unusable for meta-analysis all reported non-significant differences between treatment and control groups for weight/body composition outcomes. Conclusions: Based on present evidence, recommending increased F/V consumption to treat or prevent obesity without explicitly combining with efforts to reduce intake of other energy sources is unwarranted.

T-484-P
Energy Density and Macronutrient Composition During Short Term Overeating Results in Incomplete Compensation of Energy Intake
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Background: Body weight increases during weekends and holidays suggesting that people do not compensate after short periods of overeating.

Methods: To evaluate the effects of overeating (40% of energy requirements) a high-fat low-energy density diet (HF/LED, 1.05kcal/g), high-fat high-energy density diet (HF/HED, 1.60kcal/g), and high-carbohydrate (HC) LED (1.05kcal/g) for 2-days on subsequent 4-day energy intake (EI), activity levels, appetite, and mood on an in-patient unit. Using a randomized cross-over design, energy expenditure and EI were standardized during overeating.

Results: In 20 adults with a mean ± SD BMI of 30.7 ± 4.6 kg/m2, EI was not suppressed until the second day after overeating and accounted for ~30% of the excess EI. Reductions in EI did not differ among the 3 diets yet EI decreased after the HF/HED when EI from days 2-4 were analyzed. Overeating had no effect on subsequent energy expenditure but steps/day decreased after the HC/LED and HF/HED. Sleep time was increased after the HF/HED compared to both LEDs. After overeating a HF/HED vs. HF/LED, carbohydrate cravings, hunger, prospective food consumption, and sadness increased and satisfaction, relaxation, and tranquility decreased. Conclusions: Diet type had no impact on compensation over 4 days, though EI decreased from baseline after the HF/LED on days 2-4. No adaptive thermogenesis was observed, rather overeating resulted in less activity and higher sleep. The HF/HED vs. HF/LED had detrimental effects on food cravings, appetite, and mood. These results help explain previous findings that HF/HEDs are associated with hyperphagia.

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T-485-P
Conclusions: Based on present evidence, recommending increased F/V consumption to treat or prevent obesity without explicitly combining with efforts to reduce intake of other energy sources is unwarranted.

T-486-P
Effect of a Vegetarian-Like Diet on Blood Coagulation and Other Health Parameters in Blood Types A and O: An Evaluation of the “Blood Type Diet”
Carol Johnston, Jennifer M. Brown Phoenix, AZ.

Background: Although not discussed in the popular diet book “Eat Right 4 Your Type,” non-O blood types have an increased risk of thrombosis and cardiovascular disease (CVD) due in part to higher concentrations of Von Willebrand Factor (VWF). This 4-week trial examined the effects of the book’s type A, vegetarian-like diet (TAD) versus type O, high-protein omnivorous diet (TOD) on body weight and blood parameters in adults with A or O blood type.

Methods: Omnivore participants were stratified by blood type and diet (TOD) on body weight and blood parameters in adults with A or O blood type. Results: Fasting blood was analyzed for prothrombin time (PT), activated partial thromboplastin time, VWF, LDL and HDL cholesterol, triglycerides, and CRP. Results: VWF was 40% higher in type A vs. type O participants at baseline. In comparison with TOD, adherence to TAD significantly increased PT (+0.24±0.32 sec) and HDL (+2.15±5.7 mg/dl) in type O, but not type A participants. Both groups of participants lost weight on TAD (average loss=2.2 lb). No other changes were noted for TAD or TOD adherence.

Conclusions: The changes in PT and HDL in type O participants ad- hering to TAD are healthful. It appears that type A participants may be less responsive to dietary intervention and require more rigid dietary guidelines to see beneficial changes. In order to overcome an increased risk of CVD linked to higher levels of VWF, type A individuals should adhere to diets that have been established as anti-thrombotic and heart healthy by scientific research.

T-487-P
Alternate Day Fasting Versus Daily Calorie Restriction for Weight Loss and Cardio-Protection
John Trepanowski, Cynthia M. Kroege, Monica C. Klempel, Yolain M. Calvo, Krista A. Varady Chicago, IL.

Background: Alternate-day fasting (ADF) has been shown to reduce body weight and improve coronary heart disease (CHD) risk parameters in overweight and obese humans. Whether ADF produces greater improvements in

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For author conflict of interest information, see page S264
obese Intake and Appetite Ratings in Men and Women

Background: Alternate day fasting (ADF, 75% restriction fast day alternated with ad libitum feed day) is effective for weight loss in obese individuals. Whether ADF can also be used for weight maintenance, is not yet known. Accordingly, we examined the effects of modified ADF versus a conventional weight maintenance approach on body weight, visceral fat, and markers of coronary heart disease (CHD) risk. Methods: Obese subjects (n = 32) were randomized into 1 of 3 groups: 1) ADF, 2) calorie restriction (CR, 25% restriction daily), or 3) control, for a 24-week weight loss period. After weight loss, subjects began a modified ADF program (50% restriction fast day alternated with ad libitum feed day) or CR maintenance program (100% energy intake daily) for an additional 24 weeks. Results: During the weight loss period, body weight and visceral fat decreased (P < 0.01) in both the ADF and CR groups versus control. These CHD risk parameters remained unaltered during the maintenance period as well. Conclusions: These findings suggest that ADF may be just as effective as a conventional weight maintenance approach for maintaining weight loss and visceral fat loss, though the effects on CHD risk are not clear.

T-489-P
A Whole-Grain Fiber Composite Ingredient Reduced Acute Food Intake and Appetite Ratings in Men and Women

Joanne A. Harrold

Background: Previous studies suggest that type 2 resistant starch from high-amylose maize impacts satiety Highly viscous fibers have similar effects. The current study was designed to assess the satiety effects of a novel co-processed ingredient containing a viscous fiber and high-amylose whole grain corn flour. Methods: Ninety-six adults completed a crossover, placebo-controlled study comparing two doses of the ingredient (20 and 30 g) in a fruit-based smoothie served with breakfast. Ad libitum food intake was measured for the remainder of the day and visual analog scales were used to assess subjective appetite sensations. Results: Subjects consumed 7% less energy at dinner following the 30 g dose (P = 0.02) compared to control. In addition, a trend for lower lunch intake (5%) was observed for the 20 g dose (P = 0.10). Reductions were also observed for the two meals combined, with 4% lower caloric intake observed for the 20 g dose and 5% less weight of food consumed for the 30 g dose. Lower hunger was reported at 3 h after breakfast for both doses. In addition, for the 30 g dose, less hunger was reported at 3 hr after breakfast compared to control but no interaction with time was found. Similar results were found for the amount of food participants felt they could eat with lower ratings after 30 g. With ratings combined to compute an overall appetite score, a trend for an interaction of condition and time was found with subjects reporting lower appetite scores at 3 hrs after breakfast for both doses. Conclusions: These results suggest that diabetes may be a viable and recommendable option only for a unique subset of individuals.
T-492-P
Weight Loss, Glycemic Control and Cardiometabolic Response to Differential Diet Composition in a Commercial Weight Loss Program in Type 2 Diabetes
Cheryl L. Rock, Shirley W. Flatt La Jolla, CA; Nancy E. Sherwood, Kerrin Brejle Minneapolis, MN; Dennis D. Heath, Angela F. Leone, Bilge Pakiz, Kenneth S. Taylor La Jolla, CA

Background: Achieving and maintaining a healthy body weight is a primary strategy for managing type 2 diabetes. Science-based commercial weight loss programs may provide the structure and support to optimize that effort.

Methods: Across two sites, participants (227 men and women) with type 2 diabetes and BMI 25-45 kg/m² were randomly assigned to a higher carbohydrate, lower fat diet (LF); a lower carbohydrate, higher fat diet (LC), or usual care (UC) control group, to examine effects of study participation on weight loss, markers of glycemic control, and cardiometabolic risk factors. The program includes in-person individualized diet and exercise counseling, with prepackaged foods in a planned menu during the initial weight loss phase.

Results: At 6 months, mean weight change was significantly different across all arms: -10.7% in LC, -8.6% in LF, and -2.7% in UC (P<0.05). Only 6% of UC participants achieved a 10% loss from baseline weight, compared with 47% in the intervention groups (P<0.001). Mean(SD) HbA1C% differed across arms, being lower in LC (6.2%[0.8]) than in LF (6.7%[1.0]) and UC (7.2%[1.5]) (P<0.02). Fasting glucose (mg/dL) was lower in LC (125[32]) than in LF (139[40]) or UC (148[46]) (P<0.05). Among 41 subjects using insulin at study entry, 69% of those in the intervention arms decreased or discontinued insulin use before the 6-month clinic visit, compared with 8% of UC. Triglycerides decreased by 31 mg/dL in intervention subjects but did not change in the UC group (P=.003).

Conclusions: These results suggest that both dietary intervention arms achieved greater weight loss than the control group, and the LC diet produced greater weight loss and better metabolic improvements than a LF diet in individuals with type 2 diabetes. Follow-up measurements at 12 months will assess whether these favorable changes in weight and glycemic control are sustained.

T-493-P
Weight Loss in Obese Patients with Pre and Type 2 Diabetes in Response to a Medically Supervised Outpatient Very Low Calorie Diet Program
Zhaoping Li, Chi-Hong Tseng, Max Deng, Qian Li, Michelle Engle, David Hebert Los Angeles, CA

Background: Type 2 Diabetes Mellitus (T2DM) affects approximately 10% of Americans while 79 million Americans are estimated to have glucose intolerance or pre-diabetes (Pre-DM). Some prior work suggested that insulin resistant subjects lose weight more slowly. The present study was designed to determine whether obese patients with Pre-DM or T2DM would lose weight as effectively in VLCD/LCD program.

Methods: Patients enrolled in a self-paid, university-based, outpatient weight loss program with VLCD (500-800 Cal/day), exercise, and group behavioral counseling were studied retrospectively. Patients entering the program for the 1st time and attending weekly clinic for >4 weeks were analyzed in the linear mixed effects model.

Results: A total of 367 patients with T2DM, 583 patients with pre-DM, and 1143 patients without T2DM entering the program from 1991 to 2010 met all the inclusion criteria and were included in the analysis. The body weight at baseline was 104.0±20.0 kg for DM, 101.4±18.4 for pre-DM and 99.0±18.8 kg for non-DM. Weight loss and percent of weight loss within 12 months were analyzed utilizing a linear mixed effects model. There was no significant difference between DM vs non-DM (P=0.4597) and pre-DM vs non-DM (P=0.6006) in the weight loss per day in 12 months. The length of enrollment in the program was positively correlated to weight loss rates in all patients (P<0.001).

Conclusions: The data obtained in a large number of patients demonstrate that all three patient groups - obese, Pre-DM, and DM lost weight effectively over 12 months. Given the impact of weight loss on the progression of co-morbid conditions these data support the hypothesis that VLCD should be more widely used in the treatment of obese patients with type 2 DM.

T-494-P
Does Low Fat High Carbohydrate Regimen Improve Lipid Profile in Patients Following Coronary Artery Bypass Grafting Surgeries?
Amr Abdelnemom, Amr Alfaramawi Giza, Egypt

Background: The objective of this study is to compare the effect of three different dietary regimens over a period of six months, post CABG surgery on abdominal obesity and lipid profile.

Methods: A total of 105 post CABG dyslipidemic male patients were enrolled in this study. The patients were randomly allocated into three groups; low fat high glycemic index carbohydrate (LFHC); low glycemic index (LGI); and mixed dietary regimen (MDR).

Body mass index, segmental abdominal fat, muscle mass and lipid profile were measured at one month(0) post CABG, then at three months (1) and six months (2) post treatment.

Results: BMI 1 and 2 decreased significantly in the three groups (31.9±2.9, 27.3±2.4 and 37±2.6 Kg/m²), while Triglycerides (1 & 2) showed a significant increase in the LFHC group with a significant decrease in LGI and MDR groups (P value <0.05). Despite the fact that SAF (1 & 2) decreased significantly in the MDR and LGI groups (P value <0.05).

Conclusions: For post CABG patients, the low fat high carbohydrate regimen resulted in increased triglycerides with decreased muscle mass.

T-495-P
Behaviors That Predict Weight Loss Maintenance at One Year
Bobbie G. Paull-Forney, Frank Dong, Justin B. Moore Wichita, KS; Linda Gotthelf Boston, MA; James L. Early, Elizabeth Abalah Wichita, KS

Background: Few studies have sought to determine predictors of weight loss maintenance (WLM) after medical weight loss. We conducted a retrospective analysis of adult participants in a commercial weight management program (Health Management Resources®) between 2003 and 2010.

Results: Logistic regression was conducted to explore the relationship between successful weight loss maintenance at one year (WLM; sustaining ≥10% of initial body weight loss) and predictors (age, gender, ethnicity, baseline body mass index [BMI] category, percent initial body weight loss [%IBWL], meal replacement intake, fruit and vegetable [F/V] intake, activity level, and attendance of group sessions). A total of 934 participants completed 12 weeks of active weight loss and enrolled in the WLM phase.

Conclusions: Weight loss maintenance at one year was associated with ≥40 weekly group sessions and a %IBWL ≥10%. The multivariate odds ratio (OR) for successful WLM for participants attending ≥40 weekly sessions versus those attending <40 sessions was 1.10 [95% CI, 1.05, 1.14]. The multivariate OR for successful WLM for participants having lost ≥10% IBW versus participants having lost less than 10% IBW during the first 12 weeks was 5.29 [95% CI, 2.23, 12.56].

Conclusions: Achieving ≥10%IBW during an initial short term weight loss phase and consistent attendance of maintenance group sessions are associated with successful WLM at one year follow up in a commercial weight management program.

Thursday, November 14, 2013
Posters on Display: 10:00 AM – 3:30 PM and 5:30 PM – 7:00 PM
Location: Exhibit Hall A

Intervention Studies - Physical Activity Only-Adult
T-496-P
Empirically Informed Estimates of Energy Balance Compensation in Free Living Participants in Randomized Controlled Trials of Exercise Interventions
Kathryn A. Kaiser, Emily J. Dharurandhar, Karen D. Keating, Amy S. Thomas, David B. Allison Birmingham, AL

Background: Mathematical models of human energy metabolism and body weight change (WC) are available, and can estimate effects under the assumption of no active compensation. Naïve application of such models to real-world settings is inappropriate. The inclusion of a component that estimates the degree of energy balance compensation that occurs in response to exercise under high treatment fidelity condi-
strongly related to measures of physical function (r-range .46 to -.60, p < .001). Moderate relationships were found between social physique anxiety and self-reported activity (r=-.32, p<.03), strength training (r=-.31, p < .03), and fast food consumption (r=.41, p < .004). Conclusions: These findings suggest BMI data was compared to exercise self-efficacy is related to physical function abilities. Exercise programs may need to emphasize improvements in function in order for self-efficacy to translate to increased exercise behavior. In addition, social physique anxiety relationships were similar to those found in non-surgical groups, suggesting that weight loss surgery does not affect certain aspects of psychological function.

T-499-P
Effects of Chronic Exercise Training on Inflammatory Markers in Australian Overweight and Obese Individuals in a Randomized Controlled Trial
Sebely Pal, Suleen Ho, Satvinder Dhaliwal, Andrew Hills
Perth, Australia
Background: Physical activity has been shown to lower levels of inflammatory markers. However, results are inconsistent; indicating different modes of exercise may have different effects on inflammatory cytokines. We aimed to investigate the effects of 12 weeks of moderate-intensity aerobic, resistance or combination exercise on TNF-α and IL-6 compared to no exercise in overweight and obese individuals. Methods: Overweight/obese adults were randomized to four groups; no exercise, 30 minutes of aerobic, 30 minutes of resistance or a combination of 15 minutes of aerobic and 15 minutes of resistance exercise five days a week for 12 weeks. Fasting blood samples were taken for determination of inflammatory markers at baseline and 12 week. Results: TNF-α levels were significantly decreased at week-12 compared to baseline by 20.8% in the Aerobic group (p=0.011), 26.9% in the Resistance group (p=0.0001) and 32.6% in the Combination group (p=0.003). Levels of TNF-α were significantly lower in the Combination compared to the Control group after 12 weeks of exercise training (-22.6%, p=0.025) when adjusting for baseline levels. Conclusions: Twelve weeks of moderate-intensity aerobic, resistance, but mainly combination exercise training, decreased TNF-α in overweight and obese individuals compared to no exercise. Therefore, combination exercise training may be physiological relevant in decreasing risk of developing chronic diseases.

T-500-P
A Zumba® Dance Intervention Promotes Weight Loss, Body Fat Loss and Improves Aerobic Capacity in Overweight/Obese or Type 2 Diabetic Women
Sridevi Krishnan, Theresa N. Tokar, Michelle Harold, Lara Ringos, Kent Griffin, Mallory Boylan, Du Feng, Linda McMurry, Christina Esparat, Jamie A. Cooper Lubbock, TX
Background: Cardio dance regimes, such as Zumba® have recently become popular forms of exercise. We did a study to determine whether a 16-week Zumba® dance intervention would improve health, physical fitness, and attitudes toward exercise in adult women. Methods: Twenty eight sedentary women (14 overweight/obese non-diabetic (ND); 14 type 2 diabetic women (DM)) participated in this 16-week intervention (classes 3d/week, 60min/d). Baseline and post-intervention measures included: (a) anthropometric: body weight, body fat %, and waist and hip circumference; (b) fitness: aerobic capacity (Rockport walk test) muscular flexibility (sit-and-reach test), and muscular endurance (chair stand test); (c) clinical: HbA1c, fasting plasma glucose, insulin, and blood lipids; and (d) questionnaires: BREQ-2, PSNE and FPAI to evaluate positive and negative attitudes towards exercise and exercise-related autonomy (freedom to exercise). Results: Average compliance for the dance classes was 74±4.5%. Despite not being a weight loss study, the women lost weight (-1.1±0.6 kg, p<0.04), body fat (-1.2%±0.6%, p<0.05), and waist and hip circumference (-3.8±0.8, -2.9±1.3 cms, p<0.01, p<0.03 respectively). Muscular endurance increased (1.4±0.7 chair stands, p=0.03), as did aerobic capacity (1.1±0.4 mL/kg/min, p=0.05), but there was no change in flexibility. Exercise related autonomy showed a trend for an increase (3.8±0.9, p=0.07), and positive attitude scores towards exercise increased (4.7±1.1, p=0.01). There were no significant changes in physical measures. Conclusions: A Zumba® dance intervention is effective in reducing body weight, improving physical fitness and attitudes towards exercise.
**T-501-P**  
**Physical Activity among Overweight and Obese Young Adults: Association with Fitness and BMI**  
**Background:** Physical activity (PA) is an important correlate of weight status and fitness, and an important behavior for weight loss and fitness change. This study compared PA using objective and self-report, and examine associations with body mass index (BMI) and fitness in overweight and obese young adults. **Methods:** Participants (n=463; age=30.6±3.7 years; BMI=31.5±3.9 kg/m²) provided data prior to engagement in a randomized clinical trial. Participants completed a measurement of fitness using a graded exercise test, and measures of moderate-to-vigorous PA (MVPA) using a multi-sensor PA monitor (PA-MONITOR) (BodyMedia, Inc.) and questionnaires (Global PA Questionnaire [GPAQ]; Paffenbarger Questionnaire [PAFF]). MVPA from PA-MONITOR was defined as bouts ≥10 min at an intensity of ≥2 metabolic equivalents (METs). **Results:** Median (IQR) MVPA from the PA-MONITOR [100.1 (28.0, 194.0) min/wk] was significantly less than MVPA total [230 (100.0, 440.0) min/wk, p<0.001] but significantly more than MVPA recreational [36.0 (0.0, 180) min/wk, p=0.0001] and PAFF [80.0 (20.0, 180) min/wk, p=0.01]. The correlation with fitness was stronger for MVPA measured by PA-MONITOR (r=.39, p<0.001) compared to either GPAQ (total MVPA r=.06, p=.18; recreational MVPA r=.18, p=.01) or PAFF (r=.21, p<0.001). BMI was inversely correlated with PA-MONITOR [r=-.24, p<0.0001] but not with PAFF [r=.04] or GPAQ (recreational MVPA r=.02; total MVPA r=.03). **Conclusions:** MVPA varies by method of measurement, with objective measures being more strongly associated with fitness and BMI. Results suggest inclusion of objective measures of PA when examining the influence on BMI and fitness in overweight and obese adults. PA may also be important an important behavior to improve fitness and reduce BMI in overweight and obese adults. Supported by NIH (U01 HL096770)  

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**T-502-P**  
**An Unsupervised Walking Program for Overweight and Obese Women Promotes Moderate Physical Activity During Pregnancy**  
Kai Ling Kong, Christina Campbell, Randal Foster, Anna Peterson, Lorraine M. Lanningham-Foster, Ames, IA  
**Background:** Walking may be a strategy for increasing moderate physical activity (MPA) during pregnancy. The purpose was to promote MPA among overweight and obese pregnant women, via walking, and to evaluate the impact of the intervention on maternal and birth outcomes. **Methods:** Thirty seven overweight or obese pregnant women were randomly assigned to an unsupervised walking intervention or control group. Anthropometric, objective PA (StepWatch™ Activity Monitor), and self-reported diet data were collected for 4, one-week periods: weeks 10-14 (V1), 17-19 (V2), 27-29 (V3) and 34-36 (V4) of gestation. Participants provided information about maternal and birth outcomes. A cadence of ≥80 steps/min was defined as MPA, and “meaningful walking” was defined as moderate walking in ≥ 8 minute bouts. ANOVA was used to determine the differences in walking amount and meaningful walks between groups; Kolmogorov-Smirnov test was used for walking intensity distribution analysis; Fisher’s exact test was used for maternal and infant outcomes analyses. Pearson correlation was used to examine the association between pre-pregnancy BMI and gestational weight gain (GWG).  
**Results:** There was significantly more MPA among intervention group women compared to controls at V2 (overweight p < 0.0001; obese p < 0.025), V3 (overweight p < 0.0001), and V4 (overweight p < 0.0001; obese p < 0.025). Women in the intervention group significantly increased their meaningful walks at V2 (p = 0.054), V3 (p < 0.01) and V4 (p = 0.014). There were trends for intervention group women to have more favorable maternal and birth outcomes compared to the control group. Rates of GWG at measurement points during pregnancy were significantly associated with preceding rates of GWG. **Conclusions:** The walking intervention increased the MPA of overweight and obese women during pregnancy.

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**T-503-P**  
**Building an Innovative Physical Activity Program for College Students**  
Stephanie P. Goldstein, Evan M. Forman, Meghan L. Butryn, James D. Herbert Philadelphia, PA  
**Background:** There is a notable decrease in physical activity (PA) during young adulthood, which, for many, corresponds with the beginning of college. Innovative interventions are needed to promote PA in this population. Moreover, research has not addressed student interest in a web-based PA program, a medium demonstrating strong efficacy in promoting other health behaviors. **Methods:** To this end, an online survey assessing current physical activity levels and program interest and opinions has been administered to normal-overweight undergraduate students (n = 224). Fifty-eight percent indicated interest in participating in a web-based PA program that focuses on psychological and behavioral strategies for commitment to PA. **Results:** Results showed that students who preferred a web-based intervention had lower levels of self-efficacy (t(155)=2.48, p=0.01), lower levels of current PA (t(155)=−1.99, p=0.05), and a higher dissatisfaction with weight (t(155)=−3.59, p<0.001) than those who did not want a web-based intervention. When asked about program components that they find most valuable, students who preferred an Internet intervention format ranked ranked information about PA training programs higher (t(155) = −2.41, p=0.02), and ranked social support lower than those who preferred an in-person format (t(155)= 2.24, p=0.03). **Conclusions:** PA program results suggest that a PA program would be well-received by students and provide information regarding program preferences among those who would participate in a web-based intervention. Based on preliminary findings, a web-based PA program is currently being constructed for college students. The program will deliver psychological and behavioral strategies designed to enhance commitment to a PA plan. Data from the survey, as well as descriptions and samples of modules, will be presented at the conference.

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**T-504-P**  
**Do Improvements in Sleep Lead to Weight Loss and Improvements in Health with Exercise?**  
Kelly G. Baron, Kathryn Reid, Ronel Malkani, Phyllis Zee Chicago, IL  
**Background:** Recent research has linked insomnia with insufficient sleep to greater risk for cardiometabolic disease. Exercise improves health and also sleep in persons with insomnia. The goal of this study was to determine if improvements in sleep would predict improvements in inflammatory markers, glucose metabolism and BMI among older adults enrolled in a randomized trial of exercise versus non-pharmacological activity for insomnia. **Methods:** Participants included 17 healthy adults age ≥55 with primary insomnia (age M=61.5, SD=4.2, one male) with sleep duration <6.5 hours and/or sleep efficiency <85% documented with wrist actigraphy (Actiwatch-64, Minimitter). Participants were randomized to 16 weeks of either sleep hygiene plus aerobic exercise or sleep hygiene plus structured activity. At baseline and 16 weeks, participants underwent a 4 day 3 night protocol that included laboratory protocol included c-reactive protein (CRP), fasting glucose, HbA1c and BMI. Sleep-wake patterns were monitored via actigraphy and sleep diary. Sleep variables included: sleep onset latency, total sleep time, wake after sleep onset, sleep efficiency and fragmentation index. Data were analyzed with repeated measures ANOVA and correlations. **Results:** Results demonstrated that participants in both groups did not improve in inflammatory, metabolic measures or BMI from baseline to 16 weeks, however there was variability. Participants with greater improvement in sleep efficiency had greater reduction in CRP. In addition, participants who had greater change in sleep were trends for intervention group women to have more favorable maternal and birth outcomes compared to the control group. Rates of GWG at measurement points during pregnancy were significantly associated with preceding rates of GWG. **Conclusions:** These results suggest that improvements in inflammatory markers may link exercise to improvements in sleep.
Impact of Supervised Exercise Training in Subjects Awaiting Bariatric Surgery

Aurélie Baillot, Warner Mampuya, Emilie Comeau, Anne Meziat-Burdin, Marie-France Langlois Sherbrooke, Canada

Background: To optimize bariatric surgery (BS) results, experts recommend regular practice of physical activity but data is lacking concerning exercise training before BS. We aimed to evaluate the impact of a Pre-Surgical Physical Exercise Training (PreSET) on the health of subjects awaiting BS.

Methods: 50 candidates for BS will be randomized in 2 groups: one group following the PreSET (3x80min/week for 12 weeks of endurance and strength training) and a control group. The two groups receive usual interdisciplinary care with individual lifestyle counselling. Body composition, blood pressure, physical fitness, physical exercise beliefs and health related quality of life (HRQOL) are assessed before and after the PreSET, then each 3 months for one year postoperatively.

Results: Fifteen subjects are currently recruited [age = 42.0 (34.0-53.9) years, BMI = 50.2 (44.3-56.2) kg/m2] and 11 have completed the 12-weeks program. The 5 subjects in the PreSET group participated in 59.5 (42.5-77.6) % of the supervised exercise sessions proposed. After the intervention, we observed greater improvements in beliefs in exercise benefits (p = 0.05), sexual life HRQOL subscores (p = 0.07), time of half-squat test (p = 0.06) and heart cost during the 6-minute walk test (p = 0.07) in the PreSET group compared to the control group. In addition, resting systolic blood pressure (p = 0.08) and embarrassment during PA (p = 0.07) tended to be improved after the intervention only in the PreSET group. There was no difference between groups for other outcomes.

Conclusions: This preliminary data suggests positive short-term effects of a PreSET. The continuation of the project is underway to confirm these beneficial effects on long term and achieve greater statistical power.

Empirically Informed Estimates of Energy Balance Compensation in Free Living Participants in Randomized Controlled Trials of Diet or Overfeeding Interventions

Emily J. Dhurandhar, Kathryn A. Kaiser, Karen D. Keating, Amy S. Thomas, David B. Allison Birmingham, AL

Background: Mathematical models of human energy metabolism and body weight change (WC) are available, and can report effects under the assumption of no active compensation. Naïve application of such models to free living subjects may overestimate WC because they only account for passive compensation components such as shifts in requirements due to body composition changes. Aim: to quantify the amount of active compensation that occurs in response to energy intake perturbations (caloric restriction - CR or overfeeding - OF) under high treatment fidelity conditions in free living adults.

Methods: A systematic review of CR/OF randomized controlled trials (RCTs) yielded 9 studies (15 treatment arms) which met inclusion criteria in the CR trials. CR intervention periods ranged from 4 to 39 weeks. Energy prescriptions ranged from a daily average deficit of -180 to -1277 kcal in CR. Energy excess ranged from +359 to +1338 kcal daily average in OF treatment groups. An OLS regression model indicates average observed WC was 59.7% of predicted values (95% CI = 31.4 to 88.0) for CR studies. Thus, active compensation lead to a 40.3% decrement in WC. A regression model indicates in OF studies an average WC observed was 9.6% of predicted values (95% CI = 4.0 to 15.2). Thus, active compensation lead to a 90.4% decrement in WC. Conclusions: Significant active compensation occurs in free living subjects in response to caloric restriction/overfeeding interventions. Thus, projections of weight gains or losses with consumption of some energy intake interventions need to account for active compensation.

Effect of Short-Term Estrogen Replacement Therapy on Endothelial Function of Overweight/Obese Postmenopausal Women: A Double-Blind Placebo-Controlled Randomized Study


Background: Postmenopausal women are at risk for cardiovascular (CV) and metabolic diseases. Visceral adiposity is also a risk factor for such conditions. Microvascular dysfunction is a predictor for type 2 diabetes mellitus and also for CV events. We aimed to investigate the isolated effects of estradiol on endothelial function (EF) of overweight/obese postmenopausal women.

Methods: We evaluated the effect of transdermal estradiol gel, 1mg/day during 3 months, on muscle microvascular function, measured by venous occlusion plethysmography, and on markers of endothelial function (ICAM-1 and E-selectin) in non-diabetic overweight/obesity postmenopausal women. Muscle forearm blood flow (FFB) was measured at resting and after 3 minutes ischemia during post-occlusive reactive hyperemia (PORH).

Results: 44 women were recruited (5.7 ± 2.30 years, BMI 31.5 ± 2.54 kg/m2) and randomized into two groups: placebo (n=22; 51.4 ± 2.15 years, BMI 31.48 ± 2.85 kg/m2) and estradiol (n=22; 52.1 ± 2.44 years, BMI 31.5 ± 2.24 kg/m2). Mean time from menopause did not differ between groups (3.45 ± 2.3 vs. 3.98 ± 2.75 years; NS). At baseline, groups were similar in weight, waist circumference, systolic and diastolic blood pressures, glycemia, insulinemia, microvascular FBF, and levels of total cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides, ICAM-1 and E-selectin. Placebo did not add any benefit on the analyzed parameters, although estradiol gel was able to decrease ICAM-1 (194.65 ± 176a36 mg/ml; p < 0.01) and E-selectin (75.25 ± 30.9 vs. 67.5 ± 21.21 mg/ml; p < 0.05). Furthermore, FBF at resting (1.97 ± 0.65 vs. 2.3 ± 0.7 mg/ml/min/100ml tissue -1; p < 0.01) and during PORH (5.95 ± 2.3 vs. 7.49 ± 3.01 ml/min/100ml tissue -1; p < 0.01) increased with the use of estradiol.

Conclusions: Our findings demonstrated that overweight/obese postmenopausal women improved EF with short-term use of estradiol.
T-509-P
Acute Satiety Effects of Egg/Sausage-Based Convenience Breakfast Meals in Premenopausal Women
Tia M. Raines Addison, II, Heather J. Leudy Columbia, MO; Kristen D. Sanosby, Andrea L. Lawless, Kevin C. Maki Addison, IL.
Background: Dietary protein at breakfast has been shown to enhance satiety and reduce subsequent energy intake (EI) more than carbohydrate or fat. The objective of this trial was to examine the acute effects of commercially-prepared egg/sausage-based breakfast meals at two different protein levels (30g and 40g/meal), compared to a pancake breakfast (3g protein) and no breakfast (water), on appetite ratings and EI at a subsequent meal. Methods: Premenopausal women (N=34; age 32.2±1.6 yr; BMI 24.9±0.5 kg/m²) consumed one of three meals or water only, on four separate days in a randomized sequence. Test products provided ~280 kcal/serving and were similar in fat (12-14g) and fiber contents (0-1g). Visual analog scale ratings for indices of perceived appetite and satiety were measured at baseline and 30 min intervals for 240 min. EI was recorded at an ad libitum pasta/sauce lunch meal at 240 min. Results: The moderate and higher protein meals showed reduced appetite and increased satiety ratings vs. the pancake and no breakfast conditions (P<0.001 for all). Median EI at the lunch meal was less following the moderate and higher protein meals (661 and 592 kcal, respectively) vs. the pancake (779 kcal; P<0.01 vs. 40g protein; P<0.05 vs. 30g protein) and no breakfast (746 kcal; P<0.05 for all conditions). Median total EI from the test condition + lunch meal was higher (P<0.001) for the moderate and higher protein meals (941 and 882 kcal, respectively) vs. the no breakfast condition (746 kcal), and less than the pancake breakfast (1054 kcal; P<0.01 vs. 40g protein only). Conclusions: These results suggest that egg/sausage convenience meals providing 30g or 40g protein/serving produce greater appetite control and satiety and reduce subsequent intake at lunch relative to a lower-protein meal, or no breakfast. Supported by Hillshire Brands.

T-510-P
Body Fat Remains Elevated in Young Men Six Months After Short-Term Energy Excess
Darcy L. Johannsen, Charmaine S. Tam, Eric Rauvissin Baton Rouge, LA.
Background: While the effects of overfeeding on weight gain are well-studied, less is known about the dynamics of weight recovery following overfeeding (OF) in humans. The purpose of this study was to examine fat deposition after 2 months of controlled overfeeding and the recovery of weight and body composition over the next 6 months of eating ad libitum. Methods: After comprehensive investigations at baseline (BL), we overfed 29 healthy men (27.5±5, BMI 25.5±2.3) for 8 weeks 40% above their BL energy requirements with a diet composed of 41% CHO, 15% protein and 44% fat. Subcutaneous abdominal (SAT) and visceral (VAT) adipose tissues were measured by MRI, intrathoracic (IHL) and intramyocellular lipid (IMCL, soleus) by 1H-MRS, and whole-body fat-free (FFM) and fat mass (FM) by DXA at BL, after OF, and at 6 months post-OF. Here we report data only on those men who returned for post-OF testing (n=25). Results: Participants gained 4.1±1.5 kg of FM and 3.3±1.4 kg of FFM during overfeeding (total gain, 7.4±2.0 kg). SAT increased by 1.3±0.8 kg (30%), VAT by 0.4±0.2 kg (61%) and IMCL by 0.1±2 %lipid (23%) (all p<0.05), whereas IHL did not change. Subjects lost 1.7±1.3 kg at 1 month post-OF, 3.9±2.1 kg at 3 months post-OF, and 4.1±3.6 kg at 6 months post-OF, i.e. a 55% loss of the overfeeding-induced weight gain. Whereas FFM had returned mostly to BL levels by 6 months post-OF (>0.6±2.0 kg over BL, p=0.17), participants retained 44% of FM, 38% of SAT, 40% of VAT, and 78% of the IMCL gained during overfeeding (all p<0.05 vs. BL). Conclusions: In conclusion, body weight and composition did not spontaneously return to baseline levels 6 months after overfeeding. Even in these young men, almost half of the fat gain was retained and alarmingly, lipids remained elevated in ectopic depots (skeletal muscle, viscera) associated with unhealthy metabolic consequences.

T-511-P
Comparison of Pursestring Versus Interrupted Suture Technique in Endoscopic Full-Thickness Transoral Outlet Reduction
Nitin Kumar, Christopher C. Thompson Boston, MA.
Background: Weight regain after Roux-en-Y gastric bypass (RYGB) is correlated with dilated gastrojejunal anastomosis (GJA). Endoscopic transoral outlet reduction (TORe) is a safe and effective modality for management of dilated GJA. Although interrupted suture placement (IT) has proven effective in arresting weight regain in a randomized controlled trial, the pursuing suturing technique (PT) uses a single suture to distribute the force applied to tissue. Aperture size is better controlled as suture is tightened over an endoscopic balloon. The pursuing technique may result in increased magnitude and durability of weight loss. Methods: All consecutive TORe procedures performed using a full-thickness suturing device with a 6-month follow-up were included. Percent excess weight loss (%EWL) was determined. Statistics are reported as mean ± SEM. Results: 45 patients had TORe with IT and 16 patients had PT. Baseline characteristics were similar between groups, including gender (IT 24% male, PT 25% male), age (IT 49.3±1.5, PT 51.2±2.7 y), and BMI (IT 40.4±1.6, PT 38.3±1.6); all p>0.05. Anatomic characteristics, including pouch length (IT 4.3±1.0 cm, PT 4.1±0.4 cm) and GJA aperture (IT 25.4±1.0 mm, PT 22.5±1.9 mm), were similar. Post-TORe GJA aperture was 6.2±0.3 mm in the IT group versus 10.1±0.4 mm in the PT group (p<0.01). In the IT group, one patient had bleeding requiring transfusion and one patient required dilation for nausea; there were no complications after PT. There was a trend towards increased 6-month %EWL (IT 17.0 ±2.2%, PT 25.2±5.3%); p=0.10. Conclusions: Both techniques demonstrated safety for transoral outlet reduction. Patients who underwent purses- tring technique demonstrated a trend towards higher %EWL at 6 months. Further study is needed to assess whether there is a difference in long-term durability and weight loss.

T-512-P
The Effects of Diabetic Medication on Mean Fat Tia M. Rains, Sharman Uddin Montclair, NJ.
Background: 25.8 million individuals in the United States suffer from type 2 diabetes. Diabetes can be controlled using several different options. However, little is known about the effect of combining lifestyle interventions with different types of pharmacological controls. Methods: The purpose was to investigate the effects of exercise on type 2 diabetes patients grouped by different standard diabetes regulation medication. A recent exercise intervention in type 2 diabetes patients randomized participants into three intervention groups; aerobic, resistance, and aerobic combined with resistance. We calculated mean loss of fat in all participants grouped by medication types: Biguanide, Sulfonylony, Thiazolid, Combo Class, Incretins, DPP4, Hypoglycemia, Anthyperglycemic, Alphaglucoidase, and Insulin. Results: It was found that the highest reduction in fat mass was in the Biguanide group (-1.672±1.51). The Sulfonylurea group was resistant to loss of fat (0.015±1.58). The Incretins appeared to have fat loss comparable to exercise interventions in non-diabetic participants (-1.19±1.21). Conclusions: The information obtained for the Sulfonylurea medication was from 45 patients, 137 patients for Biguanide, and 25 patients for the Incretins. Conclusions: It is a well-documented fact that five percent of mass body loss improves diabetes. Knowledge about just how little or how much medication affects weight regulation is extremely significant for doctors, especially when they are prescribing medication and life style interventions to their patients. Some of the groups studied a small amount of patients. Therefore, increasing the number of individuals within the groups will help further research on interventions with people taking diabetes medications.

T-513-P
Effects of Obesity-Related Health Status Changes on Behavioral Weight Loss Treatment Utilization in an Integrated Healthcare Setting
Megan A. McVay, William S. Yancy Durham, NC; Sandeep Vijan Ann Arbor, MI; Lynn Van Scoyoe, Brian Neelon, Corrine I. Voils, Matthew L. Maciejewski Durham, NC.
Background: Initiation of behavioral weight loss treatment may be triggered by weight gain or by new diagnosis of an obesity-related comorbidity, events which may also motivate sustained treatment use. Methods: In a retrospective cohort study of 45,272 Veterans Affairs (VA) patients with BMI ≥30 kg/m², we used logistic regression to examine whether recent weight change or obesity-related comorbidities newly diagnosed in past 6 months were associated with initiation of a VA behavioral weight management program (MOVE!) in 2010. Among patients initiating MOVE!, we examined whether weight change or new obesity-related comorbidity diagnoses prior to initia- tion were associated with sustained MOVE! use (> 8 sessions). Weight and diagnoses of 10 obesity comorbidities were extracted from medical records.
Weight change in prior year was categorized as >3% weight loss, no weight change (<3% change), 3-5% weight gain, 5-10% weight gain and >10% weight gain. Analyses were adjusted for age, sex, race, marital status, baseline BMI, number of primary care visits in previous two years, and pre-existing obesity comorbidities. Results: Patients were 91% male, 68% white, and had a mean age of 58. Patients were more likely to initiate treatment if they had weight gain of 1% or greater in prior year (3-5%: odds ratio (OR)=1.64, 95% CI (1.52,1.77); 5-10%: OR=1.99 (1.84, 2.16), 10%+: OR=2.68, 95% CI (2.32, 3.10)) or if newly diagnosed with any of the 10 examined obesity-relevant comorbidities (ORs: 2.14-3.59). Recent weight change and newly diagnosed comorbidities were generally not associated with sustained MOVIE! use. Conclusions: Adverse obesity-related health events were associated with initiation of behavioral weight loss treatment offered at no cost in an integrated healthcare setting but not associated with persistence with the program.

T-514-P
The Relationship between Pre-Treatment Macronutrient Intake and Weight Loss During a Randomized Trial of Different Diet Approaches
Megan A. McVay, Amy S. Jeffreys, Maren Olsen, Corrine I. Voils, Heather A. King, William S. Yancy Durham, NC
Background: Across two diets restricting different macronutrients, pre-intervention intake of the macronutrient targeted for reduction may be associated with weight loss during intervention. Methods: The parent study compared a low carbohydrate diet (LCD; n=71) to a low fat diet with Orlistat therapy (LFD+O; n=73) over 48-weeks in overweight and obese Veterans Affairs patients. Percent fat and carbohydrate intake were measured at baseline using 4-day food records analyzed with nutrition software. Weight was measured at intervals of 2 weeks (1-24 weeks) and 4 weeks (24-48 weeks). For current post hoc analyses, linear mixed models of weight over time were fit separately for each diet with model predictors of baseline percent macronutrient intake: linear, cubic, and quadratic time effects; and the interaction of time and baseline macronutrient intake. Results: Participants mean age was 52, baseline BMI 39.3, and 72% were male. For LCD, lower baseline percent carbohydrate intake was associated with more rapid initial weight loss (linear interaction: p=0.02) and more rapid weight regain (cubic interaction: p=0.03), but not weight at intervention end. For LFD+O, lower baseline percent fat intake was not associated with initial weight loss rate or weight at intervention end, but was associated with less rapid weight regain (cubic interaction: p=.001). Follow-up exploratory analyses showed that lower baseline percent fat intake was also associated with slower weight regain in LCD; baseline carbohydrate intake was not associated with weight in LFD+O. Conclusions: Pre-intervention intake of a macronutrient targeted for reduction has an inconsistent effect on weight in the two diets studied and is not influential on weight at intervention completion. Pre-intervention lower fat intake may be a marker for greater dietary adherence capability regardless of diet type.

T-515-P
Influence of a Childhood Obesity Prevention Program on Parent Body Mass Indexes
Edward Coffield, Allison J. Nihiser, Bettylou Sherry Atlanta, GA; Christina D. Economos Boston, MA
Background: The Shape-Up Somerville (SUS) childhood obesity intervention altered children’s school and community environments to encourage healthy dietary practices and physical activity. While SUS focused on children, we hypothesize that many of its environmental changes influenced other community members. For instance, all Somerville residents, not just children, had access to increased opportunities for physical activity through city walkability/bikeability ordinances. The spillover effect is likely to be strongest among parents/guardians (parents) of SUS children because they were exposed to both SUS school- and community-based components. This study investigates whether SUS was associated with body mass index (BMI) changes in parents of children that participated in the SUS intervention. Methods: Data collection for the SUS intervention’s control and treatment groups occurred over two complete school years (2003/04-2004/05). In addition to covariates, parents’ baseline and post-study BMIs (self-reported) were extracted from pre- and post-study self-administered questionnaires. Parent BMI changes were analyzed with a matching estimator model accounting for non-exact covariate matches, non-constant treatment effects, and heteroskedasticity. The model accounted for the diverse demographics of the SUS sample (n=530) through a number of covariates including race, Hispanic ethnicity, age, language spoken at home, and education. Results: The results indicate that the SUS program had positive spillover effects on parent BMI. Conclusions: SUS’ average treatment effect on BMI of treated parents was -0.391 (95% CI -0.774 to -0.008). Results from alternative matching and more traditional estimation methods were similar. Conclusions: The results support the hypothesis that community-based childhood obesity interventions can impact children’s parents.

T-516-P
Using Formative Work to Improve Recruitment of Young Adults Into Behavioral Weight Loss Programs
Jessica G. LaRose, Autumn Lanoye, Laura J. Caccavale, Megan Blumenthal Richmond, VA; Deborah F. Tate Chapel Hill, NC; Rena R. Wing Providence, RI
Background: Young adults (YA) are underrepresented in behavioral weight loss (BWL) trials and little is known about how best to recruit them. Methods: We recently conducted SPARK RVA, a randomized pilot study comparing 3 approaches to BWL with YA. Recruitment for this trial was informed by extensive formative work, which suggested that messages should be gain-framed and focused on lifestyle, fitness and feeling better, rather than weight loss. Data also indicated we should recruit via on-line outlets and email/listsers, and use a recruitment website and a web-based screening process. Results: Utilizing approaches suggested by our formative data, we recruited 196 individuals to complete the web screener over a 6-week period. The outlet with the greatest yield was radio (49.5%), followed by email/listservers (22%). Of those who completed the web screener, 46% were eligible; 81% of those individuals scheduled an orientation, 80% of those attended orientation and consented, and 89% of those completed baseline visits and were randomized. This translates to 26.5% of initial screens being randomized. Men were difficult to recruit, representing 15% of initial screens, 17% of eligible screens, and 21% of those randomized. Minority recruitment was more successful, representing 53% of initial screens, 51% of eligible screens, and 54% of those randomized. Conclusions: Relatable to our previous work with YA, recruitment in SPARK RVA was markedly improved in terms of initial yield, timeline, and percentage of participants retained through screening and randomization. Although radio emerged as an unexpected high yield outlet, employing strategies routed in formative work appears to have enhanced recruitment efforts with this difficult to engage age group. Details regarding messages used and implications for future recruitment efforts with YA will be discussed.

T-517-P
Patient Attendance and Weight Loss at a Weight Management Clinic in a County Academic Center
Eileen Seeholzer, Charles Thomas, Chiajin Chiou Cleveland, OH
Background: Few clinics offer low-cost integrated behavioral, medical, and risk factor management of obesity for adults. This project’s purpose was to evaluate attendance and weight loss in patients at a weight management clinic (WMC) at an academic county medical center serving a diverse population. Methods: Review of electronic medical record (EMR) data for 4,162 adult patients seen in WMC 6/1/2005-9/30/2012 with no history of obesity surgery. Primary measures were attendance and weight loss. Secondary measures were the association of demographic factors and “weight friendly” medications for co-existing conditions on weight loss. Results: Patients were 81% female; 46% African American; Median age 47.5 yr and BMI: 44.5. Payer mix was 32% private, 23% uninsured, 13% Medicare, and 32% Medicaid. ATTENDANCE: 66% returned for a second visit; 48% for a third visits and 23% had >5 visits. WEIGHT LOSS: 51% at 3 mo. (n=1,492); 69% at 6 mo. (n=862); 65% at 12 mo. (n=561). Predictors of weight loss were commercial insurance, Caucasian race, and 55-65 years of age. The cohort’s mean weight loss at 12 mo. was 18.9 lb., BMI decrease: 3.0, and 6% weight loss. Risk factors control improved and only topiramate was associated with more weight loss than behavioral management. Conclusions: A self-sustaining WMC staffed by providers trained in obesity medicine serves diverse patients with severe obesity. This feasible, affordable, effective clinic provides ready patients weight-loss, improved risk factor management, and appropriate bariatric surgical referrals. Further analyses will examine drop-out, weight loss at 24 months, and bariatric surgery outcomes.
T-518-P

Liposuction-Induced Alterations on mRNA Expression and Levels of Inflammation-Related Adipose Tissue Cytokines Are Not Affected by Exercise Training

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Background: The aim of this study is to investigate the effects of liposuction on inflammation-related cytokines in women (20-35 years; BMI: 23.8 ± 2.2 Kg/m2) who were either exercise-trained or not after surgery. Methods: Thirty-six women underwent a small-volume abdominal liposuction. Two months after surgery they were randomly divided into two groups: trained (four-month exercise program; n=18) and non-trained (n=18). Body fat distribution and abdominal visceral to subcutaneous fat ratio (V:S ratio), plasma levels of inflammation-related adipokines, and insulin were assessed at baseline (PRE), two (POST2) and six months after surgery (POST6). Adipose tissue expression of inflammation-related adipokines was assessed at PRE and POST6. Results: V:S ratio equally increased in both groups from PRE to POST2 and POST6 by 65% (p=0.0001). Adiponectin plasma levels were markedly decreased (68%) (p<0.001) and a small decrement in adiponectin gene expression in subcutaneous abdominal and thigh adipose tissue was also observed (p=0.05, within-group comparisons). Plasma levels of IL-6, TNF-α and IL-10 were unchanged throughout the study in both groups. In contrast, these cytokines’ gene expression was significantly increased by 3 to 12 fold in both subcutaneous abdominal and thigh adipose tissue (p<0.05, within-group comparisons). Finally, insulin sensitivity was significantly improved only in the trained group at POST6 (data previously published). Conclusions: These results indicated that a small-volume liposuction markedly down-regulated the secretion of adiponectin whereas it up-regulated adipose tissue expression of inflammation-related genes six months after surgery in both groups. Importantly, exercise training improved insulin sensitivity. Thus, health professionals should strongly recommend exercise training following liposuction surgery.

T-519-P

Implementing the 5As of Obesity Management™ in a Primary Care Setting

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Background: Obesity remains poorly managed in primary care. The 5As of Obesity Management™ provide a theory-driven, evidence-based minimal intervention designed to facilitate weight management interventions. The aim of this project was to test the feasibility and effectiveness of implementing this tool in primary care. Methods: Electronic self-administered surveys were completed by pre-screened obese subjects at the end of their appointment in four clinics (>25 health care providers; HCP) from the South Calgary Primary Care Network. These measurements were performed before (Baseline, n=51) and 4 weeks after implementing the 5As of Obesity Management™ (post-intervention, n=51). Intervention consisted of one online training session (90min) and distribution of the 5As toolkit among HCPs of participating clinics. Results: Subjects completing the survey before and after the intervention were comparable in terms of age, sex, BMI, comorbidities, satisfaction and self-reported health status (p>0.2). Implementing the 5As of Obesity Management™ resulted in a 2-fold increase in obesity management discussion initiation (19 vs. 39%, p=0.03) and caused a significant increase the perceived Follow-up/Coordination efforts (self-reported PACIC components, 45±22 vs. 67±12 pts, p=0.002), as well as the Assess (50±29 vs. 66±15 pts, p=0.03) and Assist (54±26 vs. 72±13 pts, p=0.01) components of the 5As framework. Conclusions: Our results suggest that implementing the 5As of Obesity Management™ facilitates weight management in primary care by favoring dialog initiation and providing and a structured management framework.

T-520-P

Effects of Anti-Obesity Drugs, Diet and Exercise on Weight Loss Maintenance After a Very-Low-Calorie Diet: Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Background: Weight loss maintenance remains a major challenge in obesity treatment. We aimed to evaluate the effects of anti-obesity drugs (sibutramine and orlistat), diet or exercise on weight loss maintenance after an initial weight loss period with a caloric intake <1000 kcal/d. Methods: Systematic review of English articles using MEDLINE, Cochrane Controlled Trial Register, and EMBASE from 1981 to February 2013. Randomized controlled trials specifically evaluating weight loss maintenance strategies after an initial VLCD period, followed by randomization to a maintenance strategy or control. Two authors performed independent data extraction from included papers using a predefined data template. All pooled analyses were based on random-effects models. Results: 20 studies with a total of 27 study arms and 2828 participants were included, with the following treatment categories anti-obesity drugs (3 arms), meal replacements (4 arms), high protein diets (6 arms), dietary supplements (6 arms), other diets (3 arms) and exercise (5 arms). During the VLCD period, the pooled mean weight loss was -12.3kg (median duration: 8wks, range 3-16wks). Compared with placebo/control, anti-obesity drugs improved weight loss maintenance by -3.5kg (95%CI -5.5,-1.5: median duration 18mo, range 12-36mo), meal replacements by -3.9kg (-5.0,-2.8: median duration 12mo, range 10-26mo), and high protein diets by -1.1kg (-2.1,-0.8: median duration 5mo, range 3-12mo). Exercise (-0.8kg: -2.8,1.2: median duration 10mo, range 6-12mo) and dietary supplements (0.0kg: -1.4,1.4: median duration 3mo, range 3-14mo) did not influence weight loss maintenance. Conclusions: Anti-obesity drugs, meal replacements, and high protein diets were associated with improved weight loss maintenance after a VLCD, whereas dietary supplements and exercise were not.

T-521-P

Screening for Diabetes and Diabetes Risk in a Weight Loss Program

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Background: Many people are unaware of their risk of developing a serious medical condition such as Diabetes Mellitus. The purpose of this study was to examine hemoglobin A1c (HgA1c) levels of patients entering a physician-supervised weight loss program to assess usefulness of testing and changes after weight loss. Methods: This observational study occurred at four sites over 17 months (n=3482). The sample included new patients (n=2276) and patients who restarted the program (n=1206). HgA1c data was categorized into three levels: normal (<5.7%), prediabetic (5.7%-6.4%), and diabetic (>6.4%). Individuals younger than 20 were excluded. Results: 52% of new patients (n=1188) and 60% of restart patients (n=725) had HgA1c levels in the normal range. 42% of new patients (n=952) and 37% of restart patients (n=452) were in the prediabetic range. 6% of new patients (n=136) and 2% of restart patients (n=29) had levels in the diabetic range. 71% of patients in the prediabetic or diabetic range had a BMI > 40. After an average time of 14 weeks and a weight loss of 25-35 pounds, 59% of patients considered prediabetic moved into the normal range. 82% of diabetic patients moved to prediabetic and decreased their HgA1c levels by 17%. Conclusions: Individuals who experienced weight loss saw a decrease in their risk of developing diabetes. Results indicate that implementing HgA1c testing within physician-supervised weight loss programs can help patients realize the full benefits of weight loss.

T-522-P

Changes in Body Composition with Weight Loss in a Physician-Supervised Weight Loss Program

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Background: The usual objective of a weight loss clinic focuses on patient weight loss, but the ultimate goal is to lost body fat and increase fat free mass (FFM). The purpose of this study was to examine body composition changes

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For author conflict of interest information, see page S264
(i.e., body fat and fat free mass [FFM]) overtime among patients in a physician-supervised weight loss program. Methods: This retrospective, cross-sectional study examined changes in body composition (defined as percentage of FFM) while on a physician-supervised weight loss program. There were 342 new patients included in this study. Data collection occurred at one physician-supervised weight loss clinic and followed patients weekly (maximum of 16 weeks). The study included all patients enrolled for at least four weeks and focused on a subset of patients who remained in the program for at least 16 weeks. Results: On average, patients lost 13 pounds of weight (6.5% body fat) during the first month and 28 pounds if they remained in the program through week 16. On average, 70% of the weight lost in the first month was from fat with the remaining 30% coming from FFM. About 75% of the weight lost in the form of FFM was water (22% of total weight lost). At later interval visits (weeks 8, 12, and 16), the percentage of fat lost increased to 77% of total weight lost while the percentage of body water lost declined to 18% of total weight lost. Conclusions: These findings suggest that duration of participation in a physician-supervised weight loss program is positively associated with greater fat loss in patients. Strategies to increase program retention are linked to better outcomes for patients.

T-525-P

The Effect of Duodenal-jejunal Bypass Liner (DJBL) on Prediabetes with Obesity

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Background: The endoscopic DJBL (EndoBarrier) has shown to lead to weight loss and the improvement of T2D. The aim of this study was to evaluate the effect of the DJBL on glycemic control in a group of prediabetic subjects with body mass index (BMI) >35, treated for one year. Methods: DJBL-treated patients with BMI >35 were followed for 12 months (n=61). They were evaluated at baseline, 1, 2, 3, 6, 9, and 12 months after DJBL implantation for weight, HbA1c and glucose. Results: Forty-two (42) of the 61 patients were women (68%). Age was 35.4±9.7 years and BMI was 43.6±5.6 kg/m². Twenty-one (21) patients were diagnosed as diabetic or prediabetic at baseline and all were receiving at least one oral antidiabetic medication. The baseline fasting glucose (FG) for this group was 117.4±46.1 mg/dL and HbA1c was 6.8±1.7%. One month after implantation, HbA1c was 6.2±1.2% (p<0.001) and FG was 105.9±38.3 mg/dL (p<0.045) as compared to baseline. At 12 months, all patients (n=61) had lost an average of 46.1±18% of excess body weight (EW). The T2D/prediDM group, had lost 44.4±17.6% EW. HbA1c was 6.1±1.1% (p=0.004 from baseline) and 10/21 (47%) achieved normal HbA1c of <5.7%. Conclusions: The DJBL have a positive impact on glycemic control in the prediabetes population of individuals with obesity. Use of the DJBL in this group may have a significant impact on the time course of the disease.

T-524-P

Low-Level Laser Therapy Enhances Fat and Weight Loss and Decreases Waist, Hip and Thigh Circumference

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Background: This unblinded pilot study was designed to assess the ability of low-level laser therapy (LLLT) in conjunction with a ketosis diet plan to decrease body weight and body fat and reduce body circumference. Methods: Subjects were men and women (N=22) with a mean (SD) age of 45.7 (14.2) years (range, 18-82 years) and a mean BMI of 33.6 (2.5) kg/m² (range, 30.0-40.9). Each subject received three weekly LLLT treatments for 4 consecutive weeks while adhering to a ketosis diet program. The LLLT device consists of five diodes each emitting 17mW of 635nm red laser light. Each 40-minute session consisted of 20 minutes of anterior and posterior exposure. Results: After 4 weeks, subjects achieved a mean 3.9% decrease in body weight (p=0.0001) and 1.4% decrease in BMI (p=0.0001). Dual-energy X-ray absorptiometry (DEXA) scan revealed mean total body fat mass (kg) decreased from 40.0 (6.5) to 37.3 (6.2) (p=0.0001) and there was a significant decrease in mm in 142.6 (56.2) to 103.5 (41.5) hip circumference (p=0.0005). There was also a numerical but non-significant decrease in LDL and HDL cholesterol. Subjects also achieved mean circumferential decreases (inches) of their waist (1.76), hip (1.33), and right (0.97) and left thigh (1.28) (for each, p<0.0001). After 4 weeks, 77% of subjects were satisfied with the results they achieved. These improvements were maintained among subjects available for evaluation 6 months after treatment (N=8 except DEXA scan, N=3). There were no adverse events. Conclusions: LLLT in conjunction with a ketosis diet plan enhances body weight and body fat reduction and reduce body circumference.

T-523-P

Comparative Effectiveness of Group and Individual Prenatal Care on Gestational Weight Gain

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Background: Excessive weight gain during pregnancy is associated with detrimental outcomes for mother and child, including persistent maternal obesity postpartum and pediatric obesity. Yet 45% of women gain weight during pregnancy in excess of clinical guidelines. Although research has been done to facilitate healthy gestational weight gain, to date, prenatal care delivery models have not been sufficiently evaluated for their efficacy. This study examined differences in gestational weight gain for women in Centering Pregnancy (CP) group prenatal care versus the standard model of individually delivered prenatal care. Methods: We conducted a retrospective chart review and used propensity scores to form a sample of 393 (nCP = 158; nIC = 235) women (76% African-American, 13% Latina, 11% White; average age 22 years) matched on a wide range of demographic and medical background characteristics receiving prenatal care at a community health center in the South. Results: Compared to the matched group of women receiving standard prenatal care, CP participants were less likely to have excessive gestational weight gain, regardless of their pre-pregnancy weight (β = -0.99, 95% CI [-1.92, -.06], RRR = .37). CP reduced the risk of excessive weight gain during pregnancy to 54% of what it would have been in the standard model of prenatal care (number needed to treat=5). Regardless of whether women entered into pregnancy healthy, overweight, or obese, those in CP were significantly less likely to have excessive weight gain. The beneficial effect of CP was largest for overweight and obese women. Compared to the matched group of women receiving standard prenatal care, CP participants were less likely to have excessive gestational weight gain, regardless of their pre-pregnancy weight (β = -0.99, 95% CI [-1.92, -.06], RRR = .37). CP reduced the risk of excessive weight gain during pregnancy to 54% of what it would have been in the standard model of prenatal care (number needed to treat = 5). Regardless of whether women entered into pregnancy healthy, overweight, or obese, those in CP were significantly less likely to have excessive weight gain. The beneficial effect of CP was largest for overweight and obese women. Conclusions: Group prenatal care had statistically and clinically significant beneficial effects on reducing excessive gestational weight gain relative to standard individual prenatal care.
T-527-P
Changes in Body Satisfaction, Eating Behaviors and Weight Over the First Two Years of College: Relationships with Pedometer-Assessed Physical Activity
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Background: Few college women engage in enough PA to garner its health benefits (e.g., weight gain prevention), but the experiences that motivate PA in this group are not well understood. The present study was designed as a longitudinal investigation of eating, weight, and PA during the first two years of college. Methods: Women who endorsed risk factors for weight gain at the start of college (N=294) completed assessments at baseline, 6 weeks, 6 months, 1 year, and 2 years. Assessments included measured weight, body satisfaction, eating behaviors, and PA (pedometer steps). Multilevel models were used to address the resulting nested data structure. Results: Over two years, within-person change accounted for 65% of PA variability (ICC=35). The average participant took 10,893 (SD=3370) steps per day at baseline; 59% of participants increased PA over two years, whereas 41% decreased. The average difference between a participant’s highest daily PA and her lowest daily PA (per assessment) differed by 4362 (SD=3385) steps. PA was greatest at times when body satisfaction was lower (p<.04), and when dishibited eating, hedonic hunger, and weight were higher, than an individual’s average (p<.03). Compensatory exercise characteristic of eating disorders was unrelated to steps (p>15), however. Thus at times of particularly negative body image, poorly regulated eating behavior, or weight gain, college women engaged in more PA. Conclusions: Findings indicate that weight-conscious college women may increase PA in response to negative eating and weight experiences; these experiences change over time, which may partly explain inconsistent patterns of PA observed previously. Health promotion and weight gain prevention efforts would benefit from helping college women to identify alternative, positive motivators for PA, which would facilitate more consistent PA engagement.

T-528-P
Duodenal-Jejunal Bypass Liner (DJBL) Induces Favorable Changes on Hormones Involved in Glucose Homeostasis Regulation in Morbidly Obese Patients
Rodrigo Muñoz, Fernando Muñoz, Allan C. Sharp, Fernando Pimentel, Dannae Turiel, Veronica Iribarren, Alex Escalona Santiago. Chile
Background: Endoscopic placement of DJBL has shown to improve glycemic control in patients with Type 2 diabetes mellitus (T2D). However, the mechanisms associated with this effect have been poorly characterized. We sought to characterize the endocrine changes that follows endoscopic placement of DJBL in morbidly obese patients of hormones involved in glucose homeostasis. Methods: Seventeen obese patients (Seven with T2D) (mean age, 34.8±9.5 years) and a body mass index (BMI) of 42.59±5.16 kg/m2, were challenged with a 180 minutes meal test (Ensure® 237 cc) before and 12 weeks after DJBL placement. Plasma levels of total and active GLP-1, and glucagon were analyzed. Results: Mean weight loss at 12 weeks was 13±3.8 % of total body weight. Meal-stimulated levels of active GLP-1 was enhanced at 12 weeks by 2 fold has demonstrated by a 120% increase of the AUC (501 vs 1104 arbitrary units, p=0.05). Fasting glucagon levels decreased from 42±6 to 30±4 μg/ml (p=0.05). Similarly, meal-stimulated levels of glucagon were diminished as demonstrated by a 21% reduction in the AUC (848±974 vs 6740±751, p=0.05). These changes were not accompanied by significant changes in either fasting glucose or glucose tolerance in non-T2D patients. Conversely, T2D patients significantly decreased fasting glucose levels from 161±32 to 118±14 (p=0.05) and improved glucose tolerance as demonstrated by a 20% reduction on the AUC after 12 weeks of DJBL-treatment (3437±173 vs 2726±3478, p=0.05) Conclusions: Duodenal jejunal nutrient exclusion with the DJBL modify secretion of key hormones involved in glucose homeostasis. Augmented levels of active GLP-1 and decreased levels of glucagon may mediate the anti-diabetic effect of DJBL.

T-529-P
Serum Bile Acid Concentrations Rise as a Result of Duodenal-Jejunal Bypass Liner (DJBL) Implantation
Fernando Muñoz, Rodrigo Muñoz, Allan C. Sharp, Fernando Pimentel, Dannae Turiel, Veronica Iribarren, Juan F. Miquel, Alex Escalona Santiago. Chile
Background: The Duodenal-jejunal Bypass Liner (DJBL) is an effective treatment of Type 2 Diabetes (T2D) and obesity. Our understanding of mechanisms involved in weight loss and metabolic improvement resulting from DJBL placement, and of the role of bile acids in metabolic and body weight control is evolving. The aim of this study was to evaluate changes in fasting and post-prandial serum bile acids in obese patients during DJBL implantation. Methods: Seventeen obese subjects (Age: 34.8±9.5 years; BMI: 42.59±5.16 kg/m2; 76.5% female, 35% T2DM) were evaluated before and 12 weeks after DJBL placement. Mixed meal tolerance tests were performed with blood samples obtained at fasting and after the ingestion of 237cc of Ensure®. Blood samples were taken every ten minutes for 30 minutes and every 15 minutes for 180 minutes. Results: Twelve weeks after DJBL-placement patients had lost on average 13±3.8 percent of total body weight. The mean fasting serum bile acid concentration was 4.87±2.84 μmol/L at baseline to 14.23±5.3 μmol/L (p<0.005). The mean bile acid concentration during the Ensure® challenge rose –2.8-fold (p<0.05). Fasting serum bile acid levels were inversely correlated with BMI (r=0.468, p=0.005) and total cholesterol (r=0.465, p=0.005). Conclusions: Fasting and post-prandial serum bile acids rise after DJBL implantation and are inversely correlated with BMI and total cholesterol levels. It is possible that bile acids are involved in the beneficial changes observed in patients with the DJBL.

T-530-P
Improvement in Sleep Efficiency by an Amino Acid Based hGH-Secretagogue: A Pilot Study
Amy L. Heaton Baton Rouge, LA; Colleen Kelly Salt Lake City, UT; Frank L. Greenway Baton Rouge, LA
Background: A recent randomized, cross-over, double blind clinical trial showed the ability of an optimized oral amino acid based functional compound (SeroVital®) to increase serum growth hormone levels by 682% from baseline at 120 minutes (p<0.01). Given the known connection between impaired hGH levels and sleep fragmentation [van Liempt, S., et al. 2011 Psychoneuroendocrinology 36(9): 1361-1369], we investigated the direct effect of repeated daily administration of the amino acid based supplement on parameters of sleep efficiency. Methods: Fifteen healthy subjects [10 males, 5 females; mean age=33±7 years] determined to have baseline sleep parameters within a normal range (Epworth Sleepiness Scale) consumed the amino acid based supplement on parameters of sleep efficiency. Results: Both time to fall asleep and time awake in the night decreased according to the exponential model Ae^-B. For sleep latency, the average intercept was 418±8.8 and the common slope was B=0.012±0.005. For time awake in the night, the average intercept was A=3.25 and the common slope was B=0.032±0.013. Both slopes were significantly different from zero, (p=0.015 and p=0.012, respectively). Conclusions: These results suggest progressively greater sleep efficiency by measurements of sleep latency and time awake during sleep. A larger multi-center study is being planned.

T-531-P
A Picture Is Worth a Thousand Perceptions: Stereotype Content of Obese Individuals
Mary Himmelstein Piscataway, NJ; A. Janet Tomiyama Los Angeles, CA
Background: Weight based stigmatization contributes to poor psychological functioning (Puhl & Heuer, 2009). There is not a complete understanding of the content of weight based stereotypes which is necessary to combat stigmatization. Methods: In two studies the authors examine the content of stereotypes and perceptions of obese versus thin individuals using before and after weight loss photos. In study 1 heterosexual participants (N=176) rate dating profiles of opposite gender targets with photos. Ratings for each profile in-
include traits about the target, questions about the targets’ potential success at finding a partner and participants’ likelihood of choosing each individual. Two of the profiles include the same individual before and after a significant weight loss. In order to examine interactions between target and participant gender, study 2 (N=175) asks participants to rate profiles of male or female class partners for an ostensible semester long project. Profiles in study 2 include similar trait ratings. Results: In both studies obese participants are assigned more negative traits (e.g. lazy), seen as more unattractive, more disgusting, less likely to be chosen as a partner by participants, and less likely to be successful in finding a partner than their thin counterpart. Men view obese female targets as less pleasant (e.g. kind), less feminine (e.g. similar to most women), and more unintelligent than thin targets. Similarly women rate obese male targets as more pleasant, more weak, less masculine (e.g. similar to most men) and more feminine than their thin counterpart. Repeated measures ANOVAs yield significant gender (participant x target) interactions for pleasantness, feminity, attractiveness, intelligence and likelihood of choosing to work with each partner. Conclusions: Predictors of differential ratings are explored and implications are discussed.

T-532-P
Sugar-Sweetened Beverages and Adiposity: Systematic Review of RCT
Luis Mario Gómez-Miranda, Montserrat Bacardi-Gascon, Arturo Jimenez-Cruz Tijuana, Mexico
Background: An association between consumption of sugar sweetened beverages (SSB) and metabolic diseases has been observed. The aim of this study was to analyze randomized clinical trials (RCT) of 12 or more weeks of intervention among ≥13 year old individuals, which examined the consumption of SSB on adiposity. Methods: An electronic literature search was conducted in the PubMed database of RCT studies published up to April 10th, 2013. Term used for this search was “Sugar Sweetened Beverages”. Results: Four studies were found. In one of the studies, after the reduction of SSB consumption, a reduction in BMI was observed (p = 0.045). Another study showed that the reduction of 355 ml/day was associated with 0.7 kg (95% CI: 0.2-1.1, p = 0.01) of weight loss. In a different study, in the group consuming regular Coke, an increase in the visceral: abdominal subcutaneous fat ratio, was observed (p = 0.01). In another study, there were no differences on adiposity between the intervention and control groups. Conclusions: The results of this review indicate that most RCT on ≥13 year old individuals showed an effect of the consumption of SSB on adiposity.

T-533-P
Absolute or Functional Iron Deficiency in Morbidly Obese Patients
Pablo E. Osmelanczuk, Angela M. Sanchez, Natalia Pampillon, Viviana Lasagni, Cecilia Penutto, Mariela Abaurre, Sonia Osmelanczuk Guaymallen, Argentina
Background: Assess iron deficiency (ID) prevalence in morbidly obese patients. Methods: Observational prospective Study that included 89 morbidly obese patients. Analyzed data: sex, age, weight, height, BMI, iron metabolism, PCR ultrasensitive test. Population was divided according to ID condition. Results: A total of 89 patients (BMI 44.2 ± 6.54 kg/m2, age 49 ± 1 yr) attended 10 group lessons, alternating with individual consultations with internist, dietician, physician-assistant and exercise physiologist. Individualized exercise and diet instructions (1200-2000 kcal/day) were given. 120 controls (BMI 43.0 ± 0.5 kg/m2, age 51 ± 1 yr) received standard care. Results: 62 patients (65%) completed 2 years of the program, weight loss averaging 18.2 ± 1.2 kg* (14 ± 2% of IBW, 25 ± 2% of excess body weight (EBW)). 41 patients lost ≥10% of IBW, 14 of whom ≥20%, and 3 ≥30%. Controls gained 1.1 ± 0.7 kg (p:NS, 0.9 ± 0.6 % of IBW, 2 ± 1% of EBW), 2 people losing ≥10% IBW. Last observation carried forward analysis (LOCFA) showed mean weight loss of 15.1 ± 1.4 kg* (11 ± 1% of IBW, 21 ± 2% of EBW). At 2 years, 28% achieved ≥35% EBW Loss, 34% reached BMIs 15% (obese patients) or 40 (super-obese patients) and 46% reached EBWs ≥50% (20, 24 and 35% in the LOCFa respectively). The latter are criteria used in surgery to classify results as “satisfactory” or better. Preliminary results from 3 and 3.5 years (n=61 and 44) show respective mean losses of 19 ± 1% and 21 ± 1% (completers) and 12 ± 1% and 11 ± 1% of IBW (LOCFa). Conclusions: Non-surgical weight loss at 2-3 years is achievable in severely obese patients in outpatient settings; the efficacy/safety trade-off in obesity treatment is an important consideration in interpreting these results. *p<0.001
Factors Associated with Early Postpartum Weight Loss in Women with Recent Gestational Diabetes  
Jacinda M. Nicklas, Aurora, CO; Chloe A. Zeta Boston, MA; Sue E. Levkoff, Columbus, SC; Ellen W. Seely Boston, MA  
**Background:** Women with gestational diabetes (GDM) have a 30-70% risk for developing type 2 diabetes (T2DM) later in life. Postpartum weight retention is highly predictive for future obesity, and further increases risk for T2DM. We sought to identify factors predicting early postpartum weight loss in women with recent GDM. **Methods:** We recruited women with GDM during pregnancy or just after delivery. Pre-pregnancy weight was self-reported at recruitment. We extracted pregnancy history from medical records. We asked participants to come in at 6 weeks postpartum to measure weight and fill out demographic, breastfeeding, depressive symptom, and sleep questionnaires. We used backward selection to fit a multivariable logistic regression model to identify factors associated with losing 75% or more of pregnancy weight gain by early postpartum. **Results:** We measured participants at mean 72.2±21.2 weeks postpartum. Our study included 75 women (mean 33.5±5 years; pre-pregnancy BMI 31.4±5.6 kg/m2; 57% White, 29% African-American, 15% Asian, with 20% Hispanic). Mean pregnancy weight gain was 12.5±7.8 kg. 52% of participants lost at least 75% of their pregnancy weight gain by the study visit. In a multivariate model adjusting for weeks postpartum, increased age (OR 1.31; CI 1.06 to 1.76) and less pre-pregnancy weight gain (OR 0.63; CI 0.48 to 0.76) were associated with a 75% postpartum weight loss. Pre-pregnancy BMI, breastfeeding, nulliparity, and sleep questionnaires were not retained in the multivariate model. **Conclusions:** A substantial proportion of women with recent GDM lost at least 75% of their gestational weight gain by early postpartum. Older women and those who had gained less weight during pregnancy were significantly more likely to have lost 75% of gestational weight. Future analyses will address how early weight loss affects weight at one year postpartum in women with recent GDM.

**T-538-P**  
Alternate Day Fasting for Weight Loss in Normal Weight and Overweight Subjects: A Randomized Controlled Trial  
Surabhi Bhutani, Monica C. Klempler, Cynthia M. Kroeger, John Trepanowski, Kristin Hodyl, Krista A. Varady Chicago, IL  
**Background:** Alternate day fasting (ADF, 24 h ad libitum feeding, alternated with 24 h 25% energy intake), is effective for weight loss and coronary heart disease (CHD) risk reduction in obese individuals. Whether these beneficial effects are also demonstrated in non-obese individuals remains unknown. **Objective:** This study examined the effect of ADF on body weight and CHD risk in normal weight and overweight adults in a randomized controlled feeding trial. **Methods:** Thirty-two subjects (BMI 20-29.9 kg/m2) were randomized to either an ADF group (provided all fast day meals), or a control group (no meals provided), for 12 weeks. A sub-analysis of normal weight (ADF-NW) versus overweight (ADF-OW) subjects was also performed. **Results:** Body weight and fat mass decreased (P < 0.05) in ADF-NW (5.4 ± 1.1 kg; 3.7 ± 1.0 kg) and ADF-OW (5.0 ± 1.4 kg; 3.5 ± 1.1 kg) groups. Fat free mass decreased in all intervention groups. LDL cholesterol concentrations decreased (31 ± 9 mg/dl, P < 0.05) and leptin concentrations were reduced (16 ± 4 ng/ml, P < 0.05) by ADF-OW only. HDL cholesterol, triacylglycerols, homocysteine, C-reactive protein, adiponectin, and resistin concentrations remained unchanged. **Conclusions:** These findings suggest that ADF is effective for weight loss in normal weight and overweight adults. As for the cardio-protective benefits, further research is required before solid conclusions can be reached.

**T-533-P**  
An Examination of Weight Bias among Treatment-Seeking Obese Patients with and without Binge Eating Disorder  
Rachel D. Barnes, Valentina Ivezaj, Carlos M. Grilo New Haven, CT  
**Background:** Little is known about sex and racial differences in weight bias among obese individuals who binge-eat despite high rates of obesity and binge eating among both men and women and across minority groups. This study compared weight-bias attitudes among treatment-seeking obese patients with and without binge eating disorder (BED vs. NBO) and explored racial and sex differences and correlates of weight-bias attitudes. **Methods:** Participants included 221 obese patients (169 female; 109 White) seeking treatment for eating weight concerns recruited through primary care settings. 168 patients met BED criteria. Patients completed semi-structured interviews and psychometrically-established self-report measures of attitudes about obesity, eating pathology, and depression. **Results:** Patients with BED had significantly higher levels of negative attitudes towards obese people (M=60.12, SD=19.45) than NBO patients (M=67.53, SD=18.55, F(1,169)=13.01, p=.0005). Interactions between study group (BED vs. NBO) and sex (p=.020) and race (p=.056) were significant and marginally significant, respectively. Men with BED endorsed the greatest weight-bias attitudes (M=50.21, SD=13.00) compared to women with BED (M=63.49, SD=19.45, p=.002), NBO men (M=70.33, SD=20.57, p=.023), and NBO women (M=66.87, SD=18.27, p=.001); NBO African-American patients endorsed lower levels of negative weight attitudes (M=75.79, SD=15.51) than BED White patients (M=58.38, SD=17.77, p=.009). Greater negative attitudes towards obesity were significantly correlated with greater depression and eating pathology across both patient groups. **Conclusions:** Negative attitudes towards obesity, which were observed in treatment-seeking obese patients, were differentially associated with binge eating sex, and race, and were associated with heightened levels of eating pathology and depression.

**T-537-P**  
Intermittent Fasting Reduces Abdominal Obesity and Improves Cognitive Function in Obese Adults  
Sarah P. A. Brannon, Edward L. Melanson Aurora, CO; Wendolyn Gozansky Denver, CO; Bronwen Martin, Mark Mattson, Rui Wang Baltimore, MD; William T. Donahoo Denver, CO  
**Background:** Growing evidence suggests that obesity increases risk of cognitive decline and dementia. Plausible linking mechanisms include insulin resistance, inflammation, oxidative stress, and a neurotrophic deficit. Interventions that reduce obesity and improve these factors may help to prevent cognitive decline. Intermittent fasting (IF) is a dietary regimen which has significant metabolic and neuroprotective effects in animals, including improved insulin sensitivity, improved memory, increased neurogenesis and synaptic plasticity, and increased resistance to neurotoxic insult. The effects of IF on human neurocognitive function have not yet been tested. We tested the effects of weight loss by IF on human cognition and explored effects on cardiometabolic risk factors. **Methods:** Twenty-six obese adults aged 23-55 years were randomized to 8 weeks of either a standard calorically restricted dietary control (~400 kcal) or IF, in which participants alternated between eating ad libitum one day and complete fasting the next. All meals for both groups were provided. In-patient study visits at baseline, week 1, week 8 and 6 month follow-up assessed cognitive function (CNS Vital Signs®), adiposity (DXA), insulin sensitivity (FSIVGTT), and plasma leptin and the neurotrophin BDNF. **Results:** Both groups showed similar weight loss after 8 weeks (IF 6.5% ± 5.0%, SDR 5.75% ± 2.5%). Although no changes in cognition were apparent for either group at 8 weeks, the IF group showed significantly improved memory (p=0.013) and a trend towards increased BDNF levels (p=0.07) at a 6 month post-intervention time point. These changes corresponded to continued reduction in trunk fat (time x group interaction p=0.008). **Conclusions:** This exploratory study demonstrated safety of IF and found preliminary evidence of enduring visceral fat-reducing and cognition-enhancing effects in humans.
Care in a weight management clinic with non-obese individuals seeking care in a General Internal Medicine clinic. Methods: Obese patients BMI >35 kg/m² (n=114) and non-obese patients BMI <25 kg/m² (n=182) completed the GI symptoms survey between August 2011 and April 2012. The survey included 24 items pertaining to upper and lower GI symptoms. The participants rated the frequency of symptoms as absent (never, rarely) or present (occasionally, and frequently). The symptoms were clustered into five categories: oral symptoms, dysphagia, gastrointestinal reflux, abdominal pain, and bowel habits. Responses to each symptom cluster were compared between the obese and non-obese groups using logistic regression. Results: Of the 24 items, 18 had a higher frequency in the obese group (p<0.05 for each). After adjusting for age/gender, the obese patients were more likely to have upper GI symptoms: any oral symptom (OR=2.3, p=0.0013), any dysphagia (OR=2.9, p=0.0006), and any gastrointestinal reflux (OR=3.8, p=0.0001). Similarly, the obese patients were more likely to have lower GI symptoms: any abdominal pain (OR=1.7, p=0.042) and concerning bowel habits (OR=2.8, p=0.0001). Conclusions: These observations suggest a significant increase in frequency of both upper and lower GI symptoms in obese patients when compared to non-obese subjects.

T-541-P
Pre-Pregnancy BMI Predicts Breastfeeding Success in Primiparous Mothers Intending to Breastfeed
Chelsea M Murrel, Jennifer S. Savage, Michele Manni, State College, PA; Iain M. Paul, Hershey, PA; Leann L. Birch State College, PA
Background: Breastfeeding has been shown to have short and long term benefits for both mother and child. Many factors may hinder breastfeeding success, such as high pre-pregnancy BMI and excessive gestational weight gain (GWG). This study investigates the relationship among pre-pregnancy BMI, GWG, and breastfeeding success while examining potential covariates. Methods: A cohort of 118 primiparous mothers intending to breastfeed with singleton births at least 34 weeks gestation were enrolled in a randomized control trial. Breastfeeding success was defined at least 80% breastfeeding at 4 months. Excessive GWG was calculated using the 2009 IOM recommendations. Women reported how long they intended to breastfeed in the hospital shortly after birth. Results: Mean income was $50,000-$75,000. More than half the sample had completed at least some college (80%) and were married (66%). Mean pre-pregnancy BMI was 25 kg/m². Pre-pregnancy BMI predicted breastfeeding success (p<.01) after adjusting for covariates including education, marital status, income, and mother’s age. Married mothers were more likely to be successful at breastfeeding than single mothers, or mothers not married but living with a partner (p<.05). The length of intended breastfeeding positively predicted breastfeeding success (p<.0001). GWG did not significantly predict breastfeeding success as a continuous variable (p=6) or dichotomous (excessive; yes or no) (p=2). Conclusions: High maternal pre-pregnancy BMI was negatively associated with mothers’ successful breastfeeding, regardless of GWG. A majority of mothers in this sample had excessive GWG (64%), which may explain why no effect of GWG on breastfeeding success was observed. Women intending to become pregnant can improve a number of pregnancy outcomes including successful breastfeeding by achieving a healthy weight prior to pregnancy.

T-542-P
Association between Vitamin D and Inflammation in Morbidly Obese Pre-Menopausal Women
Van Nguyen, Venjanuj Lim, Enrique Ellu, Alyoo Subhashini, Karla J. Castellanos, Giamila Fantuzzi, Carol Braunschweig, Van Nguyen, Xianjun Li, Enrique Elli, Ayloo Subhashini, Karla J. Butyn, Andrew F. Frohn Philadelphia, PA
Background: Vitamin D possesses anti-inflammatory properties in vitro. It is unknown if plasma vitamin D suppresses inflammation in adipose tissues and circulating vitamin D has anti-inflammatory effects in adipose tissue in morbidly obese women with WC >139 cm and pro-inflammatory effects when WC is <139 cm. Response to routine vitamin D supplementation in morbidly obese women may vary dependent on degree of central adiposity.

T-543-P
Executive Function and Implicit Attitude Predict Early Outcome in a Behavioral Weight Loss Intervention
Stephanie M. Manasse, Evan M. Forman, Stephanie P. Goldstein, Laura A. McKenney, Philadelphia, PA; Anthony C. Ratto, Toronto, Canada; Meghan L. Butyn, Andrew F. Frohn Philadelphia, PA
Background: Converging evidence suggests that a broad range of neurocognitive and implicit processes contribute to the ability to self-regulate and engage in health behavior change. However, such processes, including executive functioning (EF) and implicit attitudes (IA) towards high-calorie foods, have yet to be investigated as predictors of outcome in behavioral weight loss interventions (BWLI). Methods: The current study measured a neuropsychological battery and a measure of IA to overall weight at BMI 27.50 kg/m²; N=29; projected N=70) women before entry into a BWLI to evaluate if IA moderated the relationship between BWL and weight change, such that those with high IA and poor EF lose the least amount of weight in a BWLI. Results: Preliminary results suggest that specific dimensions of EF and level of IA at baseline prospectively predict weight after 16 weeks of treatment, after controlling for weight at week 1, age, and IQ. Specifically, planning (p=.03, η²=23), implicit attitudes (p=.05, η²=19), cognitive flexibility (p=.06, η²=.18), and ability to inhibit incorrect responses (p=.07, η²=.17) were very strong predictors of weight at week 16. Additionally, IA strongly moderated the relations between planning (p=.02, η²=.35) and weight change and delayed discounting (p=.07, η²=.22) and weight change, such that higher IA and poorer EF performance were associated with less weight loss. Conclusions: Results highlight the importance of implicit and neurocognitive processes for outcome in BWL interventions, and provide preliminary support for the hypothesis that EF may be particularly important for success in BWL programs when IA is high. Future studies should examine whether training EF and/or IA could enhance BWLs.

T-544-P
Compliance with Wearing and Using a Wrist Worn Eating Activity Monitor During a Twelve Week Study
Phillip Jasper, Clemson, SC; Tonya F. Turner, Patrick M. O’Neil Charleston, SC; Eric R. Muth Clemson, SC
Background: The purpose of this study was to examine compliance with wearing and using the Bite Counter, a wrist worn eating activity (EA) monitor. Methods: Twenty overweight participants were instructed to wear Bite Counters for 12 wks to record their bites during all EAs. Participants were instructed to wear the Bite Counter during all EAs and to turn on the device before taking the 1st bite of food and off after taking the last bite of food. The participants had bi-weekly laboratory visits during which Bite Counter data were downloaded. Two subjects were removed from data analysis: one for not completing the study and one for taking a 3-month break during the study. Data from the remaining 18 participants were analyzed (16 F, ages 26-81, average BMI = 32). Compliance was measured as: percent of days capturing at least one EA and average EA’s/day. Results: Eight participants were identified as non-compliant, capturing an average of 40% of the days and 0.5 EA’s/day. Ten were identified as non-compliant, capturing an average of 52% of the days and 1.2 EA’s/day. The participants were further sub-divided with three participants identified as hyper-compliant, capturing an average of 98% of the days and 3.5 EA’s/day. Ten were identified as non-compliant, capturing an average of 52% of the days and 1.2 EA’s/day. The participants were further sub-divided with three participants identified as hyper-compliant, capturing an average of 97% of the days and 4.6 EA’s/day. Five identified as compliant, capturing an average of 86% of the days and 2.8 EA’s/day. Seven identified as under-compliant, capturing an average of 63% of the days and 1.4 EA’s/day. Finally, three were identified as non-compliant, capturing an average of 25% of the days and 0.5
T-545-P
Sarcopenia as a Predictor of Knee Surgery and Comorbidities in a Cohort of Obese Patients
Sarah A. Purcell, Jingjie Xiao, Robert Thornberry, Angelina Cain, Michael J. Ormsbee, Sanita Ghosh, Jeong-Su Kim, Dawn Smith, Carla M. Prado Tallahassee, FL

Background: Sarcopenic obesity is a complex condition with the double burden of low muscle mass and excess adiposity. Recent findings suggest that this condition might increase the risk of knee surgery and other unfavorable outcomes. The aim of this study was to evaluate the prevalence and implications of sarcopenia in obese patients.

Methods: Obese patients with bioelectrical impedance analysis (BIA) measurements available were recruited from a weight loss clinic serving northern Florida. Body composition variables included fat mass (FM), fat free mass (FFM) and FM/FFM index (FFMI, FM/kg) height (m²). Information on metabolic profile and health status was gathered from medical records to further examine associations between body composition and clinical outcomes. Results: Ninety-one participants (BMI 46.4±7.6 kg/m²; age 57±11 years) were included. Patients showed a wide range of FFMI (14.5-36.3 kg/m²) and high occurrence of morbidity obesity (81.3%). Sex-specific cutpoints that defined a significant association between low FFMI and knee surgery were ascertained by optimum stratification analysis: 62 (68%) patients were classified as having sarcopenia. FFMI was a predictor of knee surgery (OR = 3.33; 95% CI = 2.0-5.7; p = 0.0001). Sarcopenic patients presented with higher %FM (p = 0.014), greater FM/FFM ratio (p = 0.009), higher prevalence of diabetes (p = 0.022), higher blood pressure (p = 0.037), and higher depression rates (p = 0.048) compared to non-sarcopenic patients. Conclusions: This study provides evidence of the great variability of body composition in obese patients and links body composition, especially sarcopenia, to clinical implications such as knee surgery and co-morbidities.

T-546-P
Baseline Food Addiction Measures in Severely Obese Individuals Considering Bariatric Surgery, Dietary Weight Loss or No Treatment
Susan Murray Gainesville, FL; Kyle Morse, Alexis Conason, Allan Geliebter New York, NY; Nicole Avena Gainesville, FL

Background: Animal research suggests several neurochemical and behavioral similarities between drug addiction and binge consumption of palatable foods. Further, recent evidence shows behavioral parallels between drug addiction and excessive food intake behaviors in clinical samples. We are conducting a longitudinal study designed to assess the presence of addiction-like responses to food over time in obese individuals who 1) undergo bariatric surgery, 2) participate in a weight loss program, or 3) receive no treatment.

Methods: Participants (n=36) were recruited from the bariatric surgery office at St. Luke’s-Roosevelt Hospital in New York City, pre-bariatric surgery support groups, flyers posted in the hospital, as well as newspaper and Craigslist advertisements. Participants were asked to complete the Yale Food Addiction Scale, which assesses eating habits based on the substance dependence criteria included in the DSM-IV. The data presented here are from time point 1 (T1) and were collected prior to any intervention to provide a baseline for later longitudinal and between-group comparisons. Results: Of the 36 participants, 83.3% were female and 16.6% were male. The mean age was 35.5 (range: 19.6-62.9) and the mean body mass index (BMI) was 42.1 (range: 37.6-50.2). 41.6% of participants endorsed three or more food addiction criteria. 16.6% met the more stringent criteria for food addiction, which requires additional evidence of clinically significant impairment. Conclusions: These preliminary data show that a considerable percentage of severely obese individuals report addiction-like behaviors and attitudes regarding food. Further research regarding the effects of various weight loss strategies on food addiction scores may indicate the relevance of treatment type and associated weight loss for what appear to be unhealthy patterns of eating.
Methods: Data were collected for 79 (37 healthy-weight, 25 overweight (OW) and obesity (OB), including non-Hispanic black (NHB) women and men. Several populations have reported greater incidence of overweight or obesity among non-Hispanic black women. Bioelectric impedance analysis (BIA) fulfills the criteria for a non-invasive, economical, and valid method of assessing body composition that can be used in different settings and is well-tolerated by subjects. Bioelectric impedance analysis (BIA) fulfills many of the optimal method requirements; however, the lack of population specific equations is problematic. Therefore, the purpose of this study was to develop and cross-validate a new BIA body composition equation for young and middle-aged adults.

Results: The developed and then cross-validated using the "leave-one-out" method. A New BIA Equation Estimating the Fat-Free Mass of Young Non-Hispanic Black Women Jody L. Classy, Kelly D. Bradley, James W. Bradley, Lexington, KY; Brian Irving Rochester, MN; Leslie J. Crofford Nashville, TN Background: Several populations have reported greater incidence of overweight (OW) and obesity (OB), including non-Hispanic black (NHB) women and men. Several populations have reported greater incidence of overweight or obesity among non-Hispanic black women. Bioelectric impedance analysis (BIA) fulfills the criteria for a non-invasive, economical, and valid method of assessing body composition that can be used in different settings and is well-tolerated by subjects. Bioelectric impedance analysis (BIA) fulfills many of the optimal method requirements; however, the lack of population specific equations is problematic. Therefore, the purpose of this study was to develop and cross-validate a new BIA body composition equation for young and middle-aged adults.

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Tuesday, November 14, 2013
Posters on Display: 10:00 AM – 3:30 PM and 5:30 PM – 7:00 PM
Location: Exhibit Hall A

Behavioral and Social Epidemiology

T-555-P  
Meal Replacement Diets and Transaminase Elevations

Background: Transient transaminase elevations, often without any other liver dysfunction or clinical sequelae, occur frequently in patients (pts) on meal replacement diets for the treatment of obesity. Methods: We evaluated a sample of 51 subjects, 18 males and 33 females between the ages of 24 and 72 years who participated in a 12 week meal replacement diet. Results: Forty-nine out of 50 patients (one pt was missing a baseline AST value) had elevations of AST from baseline values. Elevations of ALT from baseline values were identified in 46 out of 51 pts. Twenty-three pts had elevations of ALT above the upper limit of normal (ULN). Average elevation above the ULN in those patients was 74.2 points. Thirty-three of the 51 pts had elevations of AST above the ULN. Average elevation above the ULN for these pts was 25.9 points. Mean weight loss was 59.45 lbs. Further analyses are underway. Mild to modest transaminase elevations above the ULN occurred in 71% of pts participating in a meal replacement diet. Conclusions: Much is known about the reductions of transaminase levels that occur with weight loss in obese individuals with fatty liver disease. Conversely, little is known about elevations in transaminase levels that occur with weight loss independent of liver dysfunction. We identify a pattern of transient elevations of transaminase levels that occur with weight loss independent of baseline liver dysfunction. Understanding these changes may aid clinicians in the appropriate management and oversight of these changing laboratory values and could avoid unnecessary work-ups and investigations given their transient nature.

T-555-P  
People-First Language, Demographics and Bias Against Persons with Diabetes or Obesity
Theodore K. Kyle Pittsburgh, PA; Rebecca Puhl New Haven, CT; Randi M. Williams Rockville, MD; Steven C. Kyle Pittsburgh, PA; Scott Kahan Washington, DC

Background: Bias and stigma contribute to poor health in both obesity and diabetes. Weight bias has been shown to be stronger than bias against other targets, but has not yet been compared with chronic diseases like diabetes. People-first language (“a person with diabetes”), as opposed to condition-first language (“a diabetic”) has been adopted when referring to some chronic diseases and disabilities, but has not been widely adopted for obesity. This study compares attitudes toward people with diabetes and obesity, and the extent to which using people-first language influences attitudes. Methods: 800 respondents completed an online study fielded by Lab42. Participants were randomized to one of four experimental conditions, in which they were asked about a person described as one who ‘has obesity,’ ‘is obese,’ ‘has diabetes,’ or ‘is diabetic.’ Respondents completed explicit measures of bias including the Universal Measure of Bias Scale and a measure of social distance. Results: Demographic characteristics were similar across all four conditions. Variations in race and ethnicity were controlled by multivariate analysis. People-first language had a marginal effect (p < 0.10) on bias and social distance toward people with diabetes, but no effect toward people with obesity. Bias against obesity was greater than diabetes (p < 0.001). Males expressed more bias and social distance than females towards people with obesity or diabetes (p < 0.05). Respondents who themselves had diabetes or obesity expressed less bias (p < 0.05). Younger respondents expressed more bias against diabetes than older participants (p < 0.05). Conclusions: More work is needed to identify whether people-first language can help reduce bias in the context of obesity. Gender differences in weight bias and social distance have important implications for efforts to address both diabetes and obesity.

T-555-P  
Overweight and Obese Young Adults Demonstrate Greater Weight Gain Throughout Adulthood Than Normal-Weight Young Adults
Gareth R. Dutton, Yongin Kim Birmingham, AL; Catherine M. Loria Bethesda, MD; Mercedes Carnethon Chicago, IL; Nefertiti H. Durant Birmingham, AL; Penny Gordon-Larsen Chapel Hill, NC; David R. Jacobs Minneapolis, MN; James Shikany Oakland, CA; Jared Reis Bethesda, MD; Stephen Sidney Oakland, CA; Cora E. Lewis Birmingham, AL

Background: Weight gain during adulthood is common. Existing studies have shown overweight/obese young adults experience greater 5-10 year weight gain than their normal-weight peers. We examined long-term (i.e., 25-year) trends in weight change beginning in early adulthood and into middle-age. Methods: The Coronary Artery Risk Development in Young Adults (CARDIA) study includes a demographically-balanced sample of 5,115 Black and White adults followed from 1985-86 (ages 18-30) to 2010-11 (ages 43-55). Linear mixed models estimated 25-year weight change, and models were stratified into four groups: Black men (BM), Black women (BW), White men (WM), and White women (WW). Regression models examined 25-year weight change according to baseline BMI (i.e., normal weight=18.5-24.9 kg/m2, overweight=25-29.9 kg/m2, obese=30 kg/m2). Results: All race-sex groups demonstrated significant weight gain over 25 years, p<0.0001. Participants who were overweight or obese (vs normal weight) at baseline had greater weight gain. Compared to participants who were normal weight at baseline, BM, BW, WM, and WW who were overweight gained an estimated mean difference of 14.2 kg, 15.5 kg, 14.0 kg, and 15.0 kg more respectively, over 25 years, all p<0.0001. BM, BW, WM, and WW who were obese at baseline gained 37.6 kg, 38.3 kg, 35.3 kg, and 35.2 kg more respectively, p<0.0001. Conclusions: Overweight/obesity in early adulthood was associated with continued and substantial weight gain into middle-age for Black and White women and men. Targeted strategies to prevent overweight/obesity before early adulthood as well as efforts to minimize further weight gain in those who are already overweight or obese are warranted.

T-555-P  
People-First Language Is an Indication of Less Explicit Weight Bias
Theodore K. Kyle Pittsburgh, PA; Rebecca Puhl New Haven, CT; Randi M. Williams Rockville, MD; Steven C. Kyle Pittsburgh, PA; Scott Kahan Washington, DC

Background: Weight bias contributes to poor health and quality of life. People-first language (“a person with obesity”), rather than condition-first language (“an obese person”), has been adopted for some chronic diseases and disabilities to help reduce stigma, but has not been widely adopted for obesity. This study examines reactions to people-first language and bias associated with people-first or condition-first language for obesity. Methods: Three separate groups of respondents participated in an online study fielded by Lab42. The three groups were: respondents who prefer using people-first language for obesity (PF group, n=256), those who prefer using condition-first language (CF, n=359), and a separate representative sample of respondents who perceive their weight status to be very overweight or having obesity (O, n=200). The PF and CF cells completed explicit measures of bias: the Universal Measure of Bias Scale and a measure of social distance. The O cell was asked about the acceptability of their doctors either calling them obese or telling them they have obesity. Results: Younger age (p<0.001), lower BMI (p<0.05), and CF language preference (p<0.001) were significantly associated with higher weight bias among participants. Male gender (p<0.001) and younger age (p<0.05) were significantly associated with greater social distance, but CF language was not. The majority of the O cell respondents (70%) found it more acceptable for their doctor to tell them they ‘have obesity’ than to call them ‘obese.’ Females were significantly less likely (p<0.01) than males to accept being called ‘obese.’ Conclusions: Individuals who use people-first language for obesity exhibit less explicit bias toward people with obesity than those who use condition-first language. People with obesity and severe overweight find people-first language more acceptable from their doctors.
T-558-P
Childhood Adversity in Relation to Adult Obesity: A Meta-Analysis
Erik Hemmingsson Stockholm, Sweden

Background: There is a need to understand the role of childhood adversity in relation to obesity and whether different forms of adversity differ in terms of risk of developing obesity. Methods: Meta-analysis of observational studies on the role of childhood adversity in adult obesity. PubMed searches using the search terms “childhood adversity”, “childhood abuse”, “trauma” and “post-traumatic stress disorder”, as well as “obesity” were carried out, resulting in nine cohort studies (4 prospective and 5 retrospective), with 19 separate comparisons of different adversity types (5 physical, 3 emotional, 6 sexual, and 5 general abuse including verbal, fear of physical abuse and humiliation). Two of the nine included studies reported dose-response effects. A random effects model was used to quantify effect sizes. Results: Overall, adults who had suffered adversity as children were significantly more likely to develop obesity (OR: 1.31, 95% CI: 1.21-1.42, P<0.01). Of the different types of abuse, the greatest risk was seen for emotional abuse (OR: 2.53, 1.05-6.11, P=0.039), followed by physical abuse (OR: 1.47, 1.21-1.80, P=0.004), sexual abuse (OR: 1.27, 1.02-1.58, P=0.038) and general abuse (OR: 1.25, 1.18-1.33, P=0.001). In studies with dose-response data, a high adversity exposure was more associated with obesity (OR: 1.31, 1.24-1.39) than low/moderate exposure (OR: 1.10, 1.06-1.14). No major difference in effect size was noted between retrospective (OR: 1.30, 1.24-1.37) and prospective studies (OR: 1.38, 1.11-1.73). Conclusions: Childhood adversity was associated with an increased risk of adult obesity, especially emotional abuse including parental neglect. There was also a dose-response association between childhood adversity and obesity risk, suggesting a key role in obesity development.

T-559-P
BMI Is Associated with Reaction Time and Working Memory in 1292 UK 7-10 Year Olds
Alexis C. Frazier-Wood Houston, TX; Susan Carnell New York, NY; Teresia O’Connor, Sheryl O. Hughes Houston, TX; Jonna Kuntsi London, United Kingdom

Background: Reaction time (RT) commission errors (CE) and working memory (WM) are domains executive functioning, associated with BMI, but data are inconsistent. A literature review of cross-sectional analyses incorporating neuropsychological task data on healthy children aged 4-18 years yielded 8 studies, which revealed 7 significant and 10 null associations, with no one study or domain showing consistently significant relationships. As sample sizes were modest (N=24-177), and one study reported a significant relationship between BMI and WM, we constructed mixed linear models to examine the association between BMI and task performance, controlling for age, gender and clustering within families. Results: BMI was positively associated with RT (F=11.05, P=0.001) and WM (F=6.50, P=0.01). BMI was not associated with CE (F=75; P=39). The associations held when additionally controlling for IQ. Conclusions: Our findings demonstrate robust associations between task performance and BMI, suggesting that BMI is associated with increased RT, and decreased WM, but not CE, an index of the ability to inhibit responses. The results implicate decreased executive functioning is associated with BMI and support the use of large sample sizes and tight limitations of age range in future studies.

T-560-P
Low Recognition of Early Childhood Weight Status among American Indian Caregivers
Emily Tomayko, Katie A. Cronin, Ronald J. Prince, Alexandra Adams Madison, WI

Background: Children from American Indian (AI) communities are disproportionally affected by childhood overweight and obesity (OV/OB), which increases the risk of adult OV/OB and other chronic diseases. Caregiver knowledge, attitudes, and behaviors influence risk factors for childhood OV/OB, and we previously reported low caregiver recognition of childhood OV in school-age AI children. Methods: To determine the recognition of childhood OV/OB in younger children, 150 2-to-5 year old children and their caregivers from 4 Wisconsin tribes were assessed by health questionnaires as part of the Healthy Children Strong Families study. For the question addressing concern of overweight, possible responses included “no, a little, a lot, or already is overweight”. Height and weight were measured, and BMI was calculated according to adult and child reference values. Results: In total, 17.2% of the children were classified as OV and 29.8% as OB; 76.6% of adults were considered OV/OB. OV/OB children were more likely to have an OV/OB parent than normal weight children (p=0.05). Caregivers were unable to recognize OV/OB in children, with only 2 of 69 children in these categories being correctly identified by their caregiver (<3%; χ², NS). In contrast, 30.6% of OV and 37.5% of OB caregivers correctly identified themselves (p=0.05). Conclusions: These data suggest that while adults were better able to recognize their own weight status, caregiver recognition of OV/OB in very young children was extremely low. Furthermore, poor recognition of weight status is occurring in younger children than previously demonstrated. Future interventions targeting caregiver perceptions and behaviors regarding healthy weight status in preschool children may help inform childhood obesity interventions in this particularly vulnerable age group of AI children.

T-561-P
Obesity in Children and Young People in Out-of-Home Care: A Systematic Review of Prevalence and Interventions
Rachael Cox, Helen Skouteris Melbourne, Australia

Background: Children placed in out-of-home care (OOHC) have typically experienced some form of abuse or neglect and experience poorer educational and health outcomes than their same-aged peers in the general community. One health outcome that appears to have been ignored is the prevalence of overweight and obesity of children placed in OOHC. Hence, the overall goal of this section was to review the current literature on weight-related issues for children in OOHC. Methods: A search was conducted in December 2012 via: Academic Search Complete, CINAHL, with Full Text, Global Health, Health Policy reference centre, Health Source: Consumer Edition, Medline, Social work Abstracts, and PsycINFO. The review was informed by PRISMA guidelines. Results: 10 studies were deemed relevant for the current review. Results from international studies (e.g., US, UK, Korea) reveal high rates of overweight and obesity among children in OOHC; furthermore, BMI appears to increase once they enter care. In contrast, there is a paucity of studies that have examined the weight status of Australian young people in OOHC. Only two of the reviewed studies (both from the UK) discussed specific approaches for intervention. Conclusions: Prevention and intervention strategies which target children as they enter OOHC are needed urgently. Given the association between unhealthy weight status, self-esteem, depression, and body image, strategies that target these factors in combination with healthy eating and physical activity habits, in this target population, may be more likely to be successful.

T-562-P
Do Parent-Child Interactions Influence Child Eating Behaviours and Child BMI? A Prospective Study of Mothers and Their Preschool Children
Helen Skouteris, Defne Demir Melbourne, Australia

Background: Past research examining the influence of mothers on preschool childhood overweight/obesity has focused predominantly on parent-centered un-directional aspects of parenting (i.e., what the mother does or believes). Over the last 5 years, we have developed a program of research focused on how parenting and mother-child interactions impact on preschool children’s
eating habits and subsequent patterns of weight gain. **Methods:** Home observations of the mother-child mealtime interactions were recorded and coded at baseline (n = 35 mother-child dyads) and then again 12 months later (n = 33); mother-child responsiveness and affect, maternal control and child compli ance were coded from the video recordings. Childhood obesity behaviors were self-reported by mothers and child weight status was measured objectively by the researchers. **Results:** Mother-child responsiveness was associated positively with child enjoyment of food, and negatively with child food fussiness; mother-child responsiveness was also negatively associated with satiety responsiveness as was mother-child positive affect. Maternal control was associated positively with child emotional over-eating, as well as child food fussiness and associated positively and negatively with child BMI, highlighting mixed results. Mothers with lower maternal control were more likely to have children with an unhealthy weight status. **Conclusions:** The findings suggest that child weight gain, as one aspect of the child’s physical development, is best understood in the ecology of family relationships and that maternal socialization of children’s eating is grounded in the extent to which the mother-child dyad are mutually responsive. Our findings have implications for current ecological models of childhood obesity.

**T-563-P**

**Prevalence of AMA-Recommended Behaviors to Prevent Childhood Obesity among Parents of Preschool-Age Children**

Sherry T. Liu, Phyllis L. Pirie, Kendall Leser, Carol Smathers Columbus, OH

**Background:** In 2007, the American Medical Association (AMA) convened an expert committee to review the literature and identify effective strategies to prevent childhood obesity. The expert committee recommended that parents adopt a set of core behaviors that focus on diet, screen time, and family meals to promote healthy weight in children. This study examined prevalence of AMA-recommended behaviors among parents of preschool-age children. **Methods:** Seven AMA-related parenting behaviors (i.e., has rule about sugar-sweetened beverages, offers fruits every day, offers vegetables every day, has rule about screen time, no television in room where child sleeps, offers breakfast every day, eats meal with child every day) were examined. Data were from a cross-sectional survey of 302 parents of randomly selected 2-5-year-olds across three low-income ZIP codes in Columbus, Ohio. The proportion of parents reporting each behavior and total number of behaviors performed were calculated. **Results:** Of the 7 AMA-related behaviors, offering breakfast every day (90.7%) and having a rule about sugar-sweetened beverages (77.2%) were most commonly reported by parents. Behaviors related to screen time were less common; 34.8% of parents do not allow a television in the room where the child sleeps and 49.7% have a rule about screen time. While more than two-thirds of parents followed at least 4 of the behaviors, only 9.9% performed all 7 behaviors. **Conclusions:** Parents of preschool-age children are engaged in obesity prevention behaviors; however, behaviors related to screen time are less common. Childhood obesity prevention efforts involving parents should be more comprehensive and emphasize the importance of adopting the set of core behaviors.

**T-564-P**

**Links between Early Childhood Household and Family Stresses and Obesity in Adolescence**

Lori A. Francis, Elizabeth J. Susman University Park, PA

**Background:** Early life exposure to stress is linked to biobehavioral dysregulation, including obesity. The purpose of this study was to examine links between children’s exposure to stressful family environments in early life (as early as 6 months) and obesity at age 15. **Methods:** Data were drawn from the National Institute of Child Health and Human Development’s Study of Early Child Care and Youth Development. Participants included 844 children from 10 locations in the U.S., followed from birth through age 15. Parents also participated in the study. We examined 3 main risk factors for the development of obesity in children, measured at 6 months and age 3: poverty level (poor/not poor); maternal depression (high/low); and maternal parenting sensitivity (high/low). Age- and sex-specific BMI z-scores at age 15 were calculated from measured height and weight; body fat percentage was assessed via tricep and subscapular skinfold measurements at age 15. Latent class analysis was used to examine family risk profiles and their association with obesity at age 15. **Results:** Adolescents from poor families and those who had mothers with higher depressive symptoms had higher BMI z-scores at age 15. Adolescents with mothers who were insensitive in their parenting at 6 months of age also had higher BMI z-scores at age 15. Four classes of risk were identified. The class that conferred the greatest risk for adolescent obesity was characterized by the highest prevalence of single parenthood, poverty, maternal depression, and insensitive parenting at 6 months. Compared to the low risk class, children from families in the high risk class had a 60% increased odds of being obese at age 15. **Conclusions:** The results from this study highlight early childhood family environmental factors that may place children at risk for obesity.

**T-565-P**

**Links between Adverse Childhood Events and Obesity in a National Sample of Youth Ages 10-17 Years**

Lori A. Francis, Rhonda Belue University Park, PA

**Background:** Exposure to early life stress is related to a number of negative cardiometabolic outcomes, including obesity. We examined links between exposure to adverse events in childhood and obesity status in 10- to 17-year-old youth. **Methods:** Participants included a sample of 95,677 youth whose data were drawn from the 2011 National Survey of Child Health (NSCH). Adult respondents were asked to indicate whether the target child experienced the following 8 adverse events in their lifetime: (1) financial hardship, (2) divorce, (3) death of a parent, (4) parent incarcerated, (5) parent physically abused, (6) witness/experienced violence in their neighborhood, (7) parent suicidal/has severe mental illness, and (8) parent abuses drugs/alcohol. Latent class analysis was used to examine various profiles of risk, and their relation to youth obesity. Respondents reported youth height and weight, which were used to calculate age- and sex-specific BMI using standardized criteria. **Results:** Five classes of risk were identified, and the class conferring the greatest risk for obesity had the greatest prevalence of multiple factors. More than 60% of youth in the highest risk class experienced 4 or more adverse childhood events. Compared to the lowest risk class (prevalence of experiences with most adverse events was close to zero), youth in the highest class had a significantly increased odds of being obese. **Conclusions:** The results from this study provide evidence for links between early life exposure to stressful events and obesity risk. The mechanisms by which this link exists should be explored.

**T-566-P**

**Sleep Duration and Body Mass Index and Waist Circumference: Findings from the National Health and Nutrition Examination Survey 2005-2010**

Earl Ford, Chaoyang Li, Anne G. Wheaton, Daniel P. Chapman, Geraldine S. Perry, Janet B. Croft Atlanta, GA

**Background:** Short sleep duration has been linked to increased body mass index and obesity. However, the shape of the relationship between sleep duration and anthropometric measures remains unsettled, and possible differences in these relationships by gender and race or ethnicity remain unclear. **Methods:** We used data from 1382 participants aged ≥20 years from National Health and Nutrition Examination Survey 2005-2010. Sleep duration was obtained with a single question and categorized as ≤6, 7-9, and ≥10 hours (short, normal, or long sleeper, respectively). Body mass index (BMI) was calculated from measured height and weight. Obesity was defined as BMI ≥30 kg/m2 while abdominal obesity was defined as waist circumference of ≥102 cm in men and ≥88 cm in women. **Results:** About 36.6% of participants reported sleeping ≤6 hours/night, 61.4% reported sleeping 7 to 9 hours/night, and 2.1% reported sleeping ≥10 hours/night. Depending on the regression model, short sleepers were as much as 2.0 kg/m2 heavier and had 3.9 cm more girth than long sleepers. Sleep duration was significantly associated with BMI and waist circumference in an inverse linear association in the entire sample, men, women, whites, African Americans, participants aged 18-39 years, and participants aged ≥60 years. The regression coefficients for Mexican Americans failed to reach statistical significance. No evidence for statistical interaction by gender and race or ethnicity was observed. However, regression coefficients were notably stronger among adults aged 20-39 years. Compared to participants who reported sleeping ≥9 hours per night, short sleepers were more likely to be obese and to have abdominal obesity. **Conclusions:** In this nationally representative sample of U.S. adults, sleep duration showed inverse linear associations with body mass index and waist circumference.

**OBESITY 2013 ABSTRACT BOOK**

**POSTER ABSTRACTS – WEDNESDAY, NOVEMBER 13 TO FRIDAY, NOVEMBER 15, 2013**

Obesity 2013, The 31st Annual Scientific Meeting of The Obesity Society

For author conflict of interest information, see page S264
T-567-P
Restrictive Feeding Style and Toddler Weight Change: Protective Effects for Toddlers At-Risk for Obesity?
Allison E. Doub, Cynthia A. Stifter University Park, PA

Background: Parents help infants learn about food and eating which influences obesity risk. Responsive feeding is recommended, yet meal and snack routines should be established in toddlerhood (Black & Aboud, 2011; Satter, 1995). Child weight and appetite shape parent feeding style but little is known about feeding control, weight, and diet in infancy. This study examined parent restrictive feeding style and change in child weight from 12 to 18 months.

Methods: Participants were 92 mother-infant dyads. At 6, 12, and 18M mothers reported on their feeding decisions and completed the original Infant Feeding Style Questionnaire (Thompson et al., 2009) which assessed feeding beliefs/behaviors and was used to create subscales for restrictive feeding and child appetite. Weight and length were measured and converted to WHO weight-for-length z scores (WFLz). Results: Mothers who reported higher levels of restrictive feeding at 12M had introduced solids later and reported more concern about their child’s weight. Restrictive feeding was higher among mothers who reported feeding on a schedule versus on demand. To test if feeding was related to change in WFLz, change in WFLz from 12 to 18M was regressed on 12M WFLz, restrictive feeding, and their interaction, controlling for maternal education. Change in WFLz was predicted by 12M WFLz (β = –.21, t = -3.95, p < .001), restrictive feeding (β = –.15; t = –2.0; p < .05), and their interaction (β = –.12, t = -1.76, p = .08). Infants high in 12M WFLz whose mothers endorsed high restriction decreased in WFLz, while those exposed to low restriction maintained.

Conclusions: Some feeding behaviors associated with restriction may be increased in WFLz, while those exposed to low restriction maintained. Infants high in 12M WFLz whose mothers endorsed high restriction decreased in WFLz from 12 to 18M while infants whose mothers endorsed low restriction maintained. These findings suggest that feeding behavior may be related to change in WFLz.

T-568-P
Dieting Makes You Fat: The Effect of Dieting on Obesity in a Longitudinal National Sample of Adults in Australia
Mohammad Shatsham, Melissa Tabbits, Raees A. Shaikh, Terry Huang, Asia Sikora Omaha, NE; Gopal K. Singh Rockville, MD

Background: Several studies have shown an association between dieting and a decrease in weight and subsequent weight gain. However, very few have employed large national samples and none have examined whether dieting is prospectively associated with obesity status. Methods: We used data from Wave 9 (2009) and Wave 10 (2010) of the Household Income and Labour Dynamics in Australia (HILDA) Survey. In Wave 9, respondents were asked: “In the last 12 months, how often have you dieted in order to lose weight? Never, once, more than once, always on a diet?” We examined the effect of this variable on obesity status in Wave 10, controlling for obesity status, physical activity, mental health, distress, self-rated health and sociodemographic variables measured in Wave 9. The statistical analysis (n = 8,888) involved multivariable logistic regression and adjusted for complex sampling design.

Results: Adjusted results revealed that the frequency of dieting was a strong predictor of obesity status (P < .001). Compared to those who never dieted in the past year, respondents who dieted once, more than once, or were always on a diet in Wave 9 had 90% (95% CI: 1.5-2.5), 200% (95% CI: 2.1-4.3) and 240% (95% CI: 2.2-5.2) higher odds of being obese in Wave 10, respectively. Conclusions: Dieting to lose weight is associated with subsequent obesity. More research is required to examine the mechanism of the association of dieting and obesity.

T-569-P
BMI, Physical Activity and Mortality in Women Diagnosed with Ovarian Cancer: Results from the Women’s Health Initiative
Yang Zhou New Haven, CT; Rowan Chlebowski Torrance, CA; Michael J. LaMonte Buffalo, NY; Catherine R. Messina Stony Brook, NY; Jennifer W. Bea Tucson, AZ; Lihong Qi Davis, CA; Robert Wallace Iowa City, IA; Jhuala Lao Morgantown, WV; Sayeh Lavsam Detroit, MI; Brian W. Walsh Beantown, MA; Mara Vitolins Winston-Salem, NC; Garnet L. Anderson Seattle, WA; Gloria E. Sarto Madison, WI; Melinda L. Irwin New Haven, CT

Background: The purpose of our study was to investigate the association of pre-diagnosis (1) measured body mass index (BMI), and (2) self-reported physical activity with ovarian cancer-specific and all-cause mortality in postmenopausal women enrolled in the Women’s Health Initiative (WHI).

Methods: Participants were 643 women diagnosed with primary ovarian cancer subsequent to enrollment in the WHI. Exposure data, including measured height and weight and reported physical activity from recreational and working used in this analysis were ascertained at the baseline visits for the WHI. Cox proportional hazard regression was used to examine the associations between pre-diagnosis BMI, physical activity and mortality endpoints.

Results: Being overweight (BMI 25.0-29.9 kg/m2) was significantly associated with a 24% lower risk of ovarian cancer specific-mortality (HR=0.76; 95% CI: 0.58-1.00) and 25% lower risk of all-cause mortality (HR=0.75; 95% CI: 0.59-0.97) compared to normal BMI (18.5-24.9 kg/m2) among women diagnosed with ovarian cancer. The only physical activity category associated with lower mortality was 9-14.9 MET hr/wk, which had a 35% lower risk of ovarian cancer specific-mortality (HR=0.65; 95% CI: 0.44-0.98) compared to no physical activity. Conclusions: Moderate obesity and moderate physical activity, assessed prior to ovarian cancer diagnosis (average 6.6 years) are associated with lower risks of ovarian cancer mortality.
Family Routines Around Sleep, Meals and Screen-Viewing in Relation to Obesity among Low-Income, Urban, Preschool-Age Children in Central Ohio

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Background: Family routines may help children maintain a healthy weight, but few studies have focused on low-income preschool-age children. We hypothesized that less structure around eating, sleeping, and screen-viewing would be associated with higher obesity prevalence. Methods: Parents (n=302) of 2- to 5-year-old children (n=361) in 3 low-income zip codes in Columbus, Ohio were recruited from the hospital-system serving most children in this area. Children were randomly selected and parents/guardians were invited to be interviewed between May 2012 and May 2013, at which time the child’s height and weight were measured. Results: Children (50% male) were a mean (SD) age of 48.5 (13.7) months, 44% were not in child care, and 15% were obese (BMI-for-age <95th percentile). On weeknights, 30.2% of children went to bed by 8:30PM, 44.3% between 8:30 and 9:30, and 25.5% after 9:30PM. Bedtime was not statistically significantly associated with obesity (χ²=0.12), and in contrast to our hypotheses, obesity was highest (19.3%) for those with early bedtimes. Among children (71.2%) who had a family meal everyday, 14.4% were obese vs. 16.4% if they had less frequent family meals (p=0.04). Having a regular morning routine was also not related to obesity (p=0.79). For a majority of the children studied, the television was usually on in their house (93%), they slept in a room with a TV (65%), and their parent did not have a rule limiting their screen-time (51%). However, of these screen-viewing-related behaviors only having a rule about screen-time was related to obesity prevalence (11.2% vs. 18.6%, p=0.05). Conclusions: In this sample of low-income preschool-age children, routines associated with meals, sleep, and screen-viewing were not strongly related to obesity prevalence, but obesity was less common among those children whose parent limited their screen-viewing.

Modeling Obesogenic Environments in Three Dimensions Using Confirmatory Factor Analysis

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Background: Obesogenic environments (OE) have been hypothesized to be drivers of the obesity epidemic. However, few studies have used advanced psychometric techniques to test a theory of how OEs are structured. Most studies have separately examined single features of OEs, leaving the literature fragmented and inconsistent. We show how psychometric theory and models can be used to improve measurement and hypothesis testing. Methods: We used confirmatory factor analysis (CFA) and data from 1026 communities (census tracts and minor civil divisions) located in 37 Pennsylvania counties. We hypothesized three distinct but correlated latent variables: 1) land-use & physical activity environments more conducive to physical activity; 2) social & economic characteristics that may be obesogenic; and 3) food environment features that promote over-consumption. Data from the census and secondary data sources were combined via GIS. Results: After reducing our initial list of 25 hypothesized indicators, we finalized 12 variables that fit our three-factor measurement model well. To establish construct validity, we used the average Body Mass Index z-scores (BMI-z) and percent of children over the 85th percentile in BMI-z from >160,000 children (ages 3-18) from electronic health records who resided in our communities to examine associations between the three-factor scores and outcome. In path analysis, all three factor scores were separately associated with both outcomes in the expected direction. A combined model, only the factor score for social and economic characteristics was independently associated with the outcome. Conclusions: Measurement has been neglected in the study of environmental factors and obesity in children. We demonstrate how CFA can be used as a measurement and analysis strategy to explore the spatially co-occurring pattern of multiple features of OEs.
T-576-P
Dieting and Restrained Eating as Prospective Predictors of Weight Gain: A Review
Emily H. Feig Philadelphia, PA; Sapna Doshi Washington, DC; Shawn N. Katterman Chicago, IL; Michael R. Lowe Philadelphia, PA

Background: Research in normal weight individuals paradoxically suggests that measures of attempted eating restriction might represent robust predictors of weight gain. This review examined the extent to which measures of dieting (e.g., self-reported weight loss dieting in the past year) and dietary restraint (e.g., the Cognitive Restraint scale from the Three-Factor Eating Questionnaire) have prospectively predicted weight change. Methods: We located and reviewed 25 prospective studies containing 40 relevant comparisons. Studies were limited to those in which participants were non-obese (with a mean BMI between 18.5 and 30) and averaged at least 12 years old. Results: Neither measure predicted future weight loss. Fifteen of the 20 comparisons (75%) that examined measures of dieting significantly predicted future weight gain whereas only 1 of 20 (5%) that examined restrained eating measures did so. Conclusions: Two plausible explanations for these findings are that: 1) dieters and restrained eaters do not differ in terms of an underlying proneness toward weight gain, but restrained eating represents a more effective means of preventing it; and 2) normal weight individuals who diet do so because they are resisting a powerful predisposition toward weight gain which dieting ultimately fails to prevent. Recent dieting in non-obese individuals may be a valuable proxy of susceptibility to weight gain. This easily-identified characteristic could identify individuals for whom obesity prevention interventions would be particularly appropriate.

T-577-PDT
Acculturation and Risk of Obesity in Hispanic Children
James Wiley Hartford, CT; Amy A. Gorin Storrs, CT; Dorothy B. Wakefield Farmington, CT; Dominica B. Hernandez Storrs, CT; Athereene Grant, Storrs, CT; Annmarie Beaulieu, Michelle M. Cloutier Hartford, CT

Background: Hispanic children in the U.S. are disproportionately affected by obesity. The role of acculturation in obesity is unclear. This study examined the relationship between child obesity, dietary intake, and maternal acculturation in Hispanic children. We hypothesized that children of more acculturated mothers consume more unhealthy foods and have higher BMI trikes. Methods: 209 Hispanic mothers (68% Puerto Rican, 12% Mexican, 20% Other) of children ages 2-4 years (50%F, 35.3 ± 7.6 months, BMI trike 73.1 ± 27.8, 30% obese, 19% overweight) were recruited for an obesity prevention/reversal study (Steps to Growing Up Healthy). The associations between baseline maternal acculturation (ARSM-II), child BMI trike, and child diet (Children’s Dietary Questionnaire) were examined. Results: Factor analysis of the ARSM-II resulted in two new factors which were named the Hispanic Orientation Score (HOS; 4 items, loadings 0.57-0.83) and U.S. Mainland Orientation Score (USMOS; 6 items, loadings -0.72-0.93). Mothers with a higher USMOS served more noncore foods (p<0.001), and had children with higher BMI trikes (p<0.04) compared to mothers with a lower USMOS. Mothers with a higher HOS served less noncore foods (p=0.0001). Children who consumed more noncore foods were more likely to be overweight or obese (p<0.01). Conclusions: Greater maternal acculturation to the U.S. is associated with a higher child BMI trike. This relationship is associated with greater noncore food consumption in children of more U.S. acculturated Hispanic mothers, and together these factors could contribute to increased obesity rates.

T-579-P
Identification and Prediction of Patterns of Dieting Strategies among 15y Girls
Katherine N. Balantekin, Jennifer S. Savage, Leann L. Birch University Park, PA

Background: While adolescent girls likely endorse different weight control strategies, this is not captured by the dichotomous measures of dieting typically used. The current objective was to identify patterns of specific weight control strategies endorsed by adolescent girls, and to determine psychosocial factors that predict group membership. Methods: The sample included 166 non-Hispanic white girls and their mothers. Girls reported dieting behaviors at 15y using an adapted version of French Weight Control Scale. Latent Class Analysis (LCA) was used to determine classes of dieting behaviors, adjusting for BMI, and to quantify measures of disordered eating, perceived peer relationship quality, and maternal encouragement to diet as predictors of group membership. Results: LCA revealed 3 distinct classes of dieting behaviors at 15y: non-dieters (ND, 35%), healthy dieters (HD, 48%, endorsed increasing exercise, reducing junk food, increasing fruits/vegetables), and meal skippers (MS,17%), endorsed healthy dieting behaviors along with skipping meals and eating low-calorie food). Girls were at increased odds of membership in the MS group if they had higher BMIs, higher levels of disordered eating, experienced greater parental encouragement to diet, and had lower perceived peer relationship quality relative to girls in ND and HD classes. However, perceived peer relationship quality, BMI, and maternal encouragement to diet did not differentiate membership in HD and ND classes. Conclusions: Dieting was common in the current sample; however, these results suggest that “dieting” does not mean the same thing to all girls. Future interventions may need to be tailored based on the pattern of weight control strategies endorsed. Research should focus on the promotion of the healthy weight control methods outlined by the Dietary Guidelines for Americans.

T-579-P
Psychosocial Correlates of Responsive Feeding Practices among Low-Income Mothers
Kari C. Kugler, Jennifer S. Savage, Brandi Y. Rollins, Leann L. Birch University Park, PA

Background: Low-income and minority populations are disproportionately at risk for obesity. Establishing solid self-regulatory skills in childhood to help navigate in an obesogenic environment is one step to curbing the obesity epidemic. Responsive feeding practices, and responsive parenting practices more generally, show some promise in establishing self-regulatory skills among children; however, very little is known about what factors are most strongly associated these parenting feeding practices, particularly among low-income populations. The current study intends to fill the gap in the literature. Methods: Data came from 337 mothers of toddlers aged 1 to 4 attending the Women, Infants, and Children program in Pennsylvania. Measures included demographic, psychosocial (e.g., attitudes about feeding practices and self-efficacy about parenting), and responsive feeding practices (e.g., limiting exposure to unhealthy foods and not using food to control behavior). Multiple linear regression analyses were performed to determine which factors were significantly associated with responsive feeding practices, controlling for maternal age, race/ethnicity, education, and BMI. Results: More indulgent attitudes about toddler eating was associated with less restriction, limiting exposure, having rules, and not bringing certain foods into the home. In addition, not being satisfied with how one is parenting was associated with less limiting exposure to certain foods but more controlling feeding practices such as restriction and pressuring. Conclusions: Based on the initial findings from this study, we find that psychosocial social factors are associated with responsive feeding practices in the anticipated direction. Final results will lay the groundwork for building an effective intervention targeting these factors, thereby reducing childhood obesity.

T-580-P
Self-Reported Advertising Exposure to Sugar-Sweetened Beverages among U.S. Youth
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Background: An Institute of Medicine (IOM) committee concluded that food and beverage marketing influences preferences and health of children, although evidence in adolescents was insufficient. There is minimal research on adolescent-reported exposure to advertising of sugar-sweetened beverages (SSBs), of which adolescents are the highest consumers of. Methods: Data were obtained from the 2012 YouthStyles Survey administered to U.S. youth aged 12 to 17 years (n=847) to examine self-reported frequency of overall food/beverage marketing exposure for soda, fruit drinks, sports drinks, and energy drinks (<1 time/week, 1 to 6 times/week, and ≥1 time/day). Multivariate logistic regression analyses were used to examine associations between frequency of SSB advertising exposure and sociodemographic variables. Results: Approximately 40% to 55% of youth reported seeing/hearing SSB advertisements ≥1 time/day. For soda advertising, the odds of seeing/hearing advertisements ≥1 time/day was significantly higher among 14- to 15-year-olds and youth whose parents had a high school education. For fruit drinks, the odds were significantly higher among African-American.
Americans and youth whose parents had a high-school education. For sports drinks, the odds were significantly higher among 14- to 15-year-old males and African-Americans. For energy drinks, the odds were higher among 14- to 15-year-olds and youth whose parents had a high-school education.

**Conclusions:** Almost half of youth sampled reported daily SSB advertising exposure, with higher exposure among 14-15 year-olds, African-Americans, and youth with less educated parents, depending on beverage type. Further research may clarify which of these sociodemographic groups among adolescents are more susceptible to possible effects of advertising, such as increased consumption of SSBs.

**T-581-P**

**Longitudinal Spousal Correlations in BMI among Older U.S. Adults**

Gregory Pavela

**Background:** Although a positive correlation in spousal BMI has been well established, less is known about longitudinal correlations in spousal BMI. Accounting for individual stability, are BMI changes in one spouse associated with changes in their partner’s BMI? This research tested for spousal correlation across sixteen years of data.

**Methods:** Data come from eight waves of the Health and Retirement Study (1992-2008), 2,371 couples were identified, with a mean age of 55 years at baseline. Dyadic multilevel models were used to estimate spousal correlation in mean BMI as well as the correlation in residual BMI scores within a given year. **Results:** The mean BMI of the typical husband and wife over all observations was estimated to be 28.39 and 28.02, respectively. There was significant positive covariance between mean husband and wife BMI (p < 0.01), with an estimated correlation of 0.22. There was also significant positive covariance between husband and wife residual BMI scores for a given year (p < 0.01) with an estimated correlation of 0.07. **Conclusions:** There is a modest positive correlation between husband and wife BMI, in line with previous research. Results from this analysis further suggest a positive correlation between husband and wife BMI residuals in a given year, albeit the association is weak. This suggests that shared environmental factors or direct actor/partner effects influence the BMI of older adults at the level of the individual as well as the dyad.

**T-582-P**

**Topping Up: Infant Feeding Practices among Low-Income Minority WIC Participants in New York**

Sally Findley, Natasha McLeod, Raquel Andres-Martinez, Mary Ann Chaisson New York, NY; Jackson Schehobu Albany, NY

**Background:** Many mothers give infants cereal before the recommended age of 6 months. Early introduction of solids correlates with obesity by age 3. A better understanding of early infant feeding practices is needed to change this practice. **Methods:** 726 caregivers of children <2 yrs. participating in New York WIC were interviewed at randomly selected WIC sites in 2 waves, 2009-10 and 2012. Caregivers were asked about infant feeding practices and current child diet and activity patterns. Logistic regression was used to estimate predictors of additions to the baby’s bottle and early introduction of solids. **Results:** Children averaged 7 months, 53% were Latino and 20% Black. 79.3% had ever breastfed, of whom 43% stopped before age 4 months. 41% received something beside formula in the bottle, and 45% were given solids foods before 6 months. Logistic regressions showed that Black and US-born mothers were more likely to add cereal and sweeteners to the bottle. Several caregiver attributes were associated with early introduction of solid foods: Black race, working, child cared for at home, HS or higher education. Previous infant feeding practices were associated with early introduction of solid foods, which was less likely for children ever breastfed (OR = 0.45), and more likely if they were given juice or soda before 6 months (OR = 3.83) or had anything added to their bottle (OR = 2.77). **Conclusions:** Adding cereal and sweeteners to formula was prevalent among WIC children in New York. This practice is associated with early introduction of solids. Changing infant feeding practices needs to include a focus on very early feeding practices, particularly among the caregivers giving their infants formula.

**T-583-P**

**Severe Early-Onset Obesity: Medical and Lifestyle Characteristics**

Amanda E. Staiano, Peter T. Katzmarzyk

**Background:** The aim was to identify medical and lifestyle characteristics that differentiate children who are severely obese. **Methods:** The sample included 407 White and African American 5-18 year-olds. Height and weight were measured in clinic, and severe obesity was defined as ≥98th BMI CDC percentile. Participants self-reported medical conditions and lifestyle behaviors. Independent sample t tests were used to examine differences in lifestyle characteristics between severely obese versus non-severely obese. Logistic regression analysis was used to compute the ORs (95% CI) of medical conditions, controlling for age, sex, race, and household income. **Results:** Thirty-five percent of the sample was obese, of which 82 were severely obese. Severe obesity was more common among African Americans than Whites (p < 0.01), but there were no significant differences by age, sex, or income. In multivariable models, compared to participants <98th percentile, those with severe obesity consumed more fast food meals (p = 0.05), slept fewer hours (p < 0.01), were less physically active (p < 0.01), and spent more hours viewing TV (p < 0.01) and using the computer (p < 0.01). Compared to obese individuals between the 95th and 98th percentile, those ≥98th percentile consumed more fast food meals (p = 0.05), slept fewer hours (p < 0.01), were less physically active (p < 0.05), and spent more hours using the computer (p < 0.05). In multivariable models, individuals with severe obesity had 2.3 greater odds (1.2 to 4.3) of asthma and 2.5 greater odds (1.2 to 5.4) of vision problems, with no differences in prescription use or other medical conditions. **Conclusions:** Severely obese children had a higher prevalence of asthma and vision problems. Lifestyle factors differed between non-severely obese versus severely obese youth, indicating opportunities for early intervention to halt the onset of severe obesity.
OBESITY 2013 ABSTRACT BOOK
POSTER ABSTRACTS – WEDNESDAY, NOVEMBER 13 to FRIDAY, NOVEMBER 15, 2013

T-585-P Neighborhood Ethnic Composition, Food Access and Dietary Acculturation among Hispanic Adolescents
Cheng Kun Wen Los Angeles, CA; Stephanie Hissell Baltimore, MD; Jinna Huih, Lauren T. Cook Los Angeles, CA; Jamarc N. Davis Austin, TX; Marc J. Weigensberg, Michael Goran, Donna Spruijt-Metas Los Angeles, CA

Background: Past research has shown that dietary fiber intake is related to reduced visceral adiposity, while sugar intake is related to increased risk of type 2 diabetes in overweight Hispanic youth. The influence of acculturation and built environmental factors on Hispanic youths’ fiber and sugar intake has rarely been studied. Methods: Multiple linear regression analyses were used to estimate the relationships between dietary sugar and fiber intake (DI), acculturation orientation (AO) and % Hispanic population (%HP) in 2000 Census tract. Models were adjusted for mean caloric intake, age, gender, and body mass index percentile (BMI%ile). Results: The analysis included 124 Hispanic youths (mean age 13.60±3.15, mean BMI%ile 90.61±16.29). No significant association between DI and AO was detected. %HP was positively associated with grams of fiber intake per day (p<0.01) and negatively associated with grams of sugar intake per day (p<0.01), controlling for mean caloric intake, age, gender, and BMI%ile. The magnitude and direction of associations between %HP and sugar and fiber intake remained significant (p<0.01) after food access were adjusted separately. Conclusions: Living in areas with high proportions of Hispanic population may protect Hispanic youths from adopting high sugar and low fiber diet regardless of youths’ acculturation orientation and food access in the immediate neighborhood. Future studies that examine youths’ dietary behaviors in other social and physical contexts, such as family and school, are needed to clarify the role of culture in association with youths’ dietary behaviors.

T-586-P Gender Differences in Weighing Comfort within Common Situational Contexts
Lori A. Klos Milwaukee, WI

Background: Self-weighing and weight monitoring are commonplace within many health-related contexts, and efficacious for weight management in certain populations. The purpose of this study was to examine the role of gender in weighing comfort within several common scenarios. Methods: As part of a larger study, undergraduates (n=232; 71% female; 89% White) reported their comfort with being weighed (1-very uncomfortable to 5-very comfortable) alone, by a health professional (HP) of the same sex and of the opposite group, and in front of a group. Repeat measures ANCOVA was used to examine between- and within-gender differences in comfort, controlling for BMI, weight management approach, and body image. Results: Overall, women expressed less comfort with weighing than men (p<0.001). Women were less comfortable than men being weighed by a HP of the opposite sex (p<0.002), or in front of a group (p<0.001). Group weighing elicited the least comfort for men and women. Women reported less comfort when being weighed by a HP of the opposite sex compared to one of the same sex (p<.002), while a HP’s gender was unrelated to men’s comfort. Conclusions: Men and women differ in their level of comfort with the weighing experience. To minimize discomfort, weighing should occur in a non-group setting, and by a health professional of the same gender as the individual being weighed.

T-587-P Overweight among African American College Students at a Historically Black University
Jaesin Sa, James Heimdal Salisbury, MD; Tracey Shrocco Bethesda, MD; Beatrice Nelson Salisbury, MD

Background: Overweight and obesity are of major concern in the United States, particularly among minority populations. Given that the obesity epidemic disproportionately affects African American college students, a greater understanding of overweight of this population is required to reduce obesity comorbidities among young African Americans. The purposes of this investigation were to examine the prevalence of overweight and to explore differences by individual student characteristics among African American college students at a historically black university. Methods: A Personal Wellness Profile questionnaire was completed by 268 African American college students (18-25 years) in 2013. Participants’ actual weight and height were measured with participants wearing light clothing without shoes, and their body mass index (BMI kg/m2) was calculated. Results: Five in ten students (47.4%; 46.6% men vs 47.9% women) were overweight or obese (BMI ≥ 25.0). More females than males (23% vs. 9%; p < .01) had a family history of obesity. Approximately twice as many females (32%) as males (17%) engaged in no days of aerobic exercise of at least 20 to 30 minutes per week (p = .022). More females than males (24% vs. 14%; p < .001) had no regular exercise program, generally avoided walking and exertion when possible. A family history of obesity, skipping breakfast, and lower family income were significantly associated with overweight (p < .05). Conclusions: This study provides important insights into interventional reducing racial/ethnic health disparities in overweight and into educational efforts helping historically black universities have a positive impact on future health disparities in overweight.

T-588-P Relationships between Maternal Depressive Symptoms and BMI in New Immigrants
Stephanie Anzmann-Frasca, Christina D. Economos Boston, MA; Alison Tovar Kingston, RI; Sarah Slowa Boston, MA; David M. Gute Bedford, MA; Alex Pirie Somerville, MA; Aviva Must Boston, MA

Background: Depression has been associated with maternal obesity in both cross-sectional and longitudinal samples. Little is known about this association among new immigrants. Methods: Participants were Haitian, Brazilian, and Latina mothers (n=344) enrolled in LiveWell, a community-based, participatory, randomized controlled lifestyle intervention to prevent overweight in new immigrants (<10 years in the US). Mothers reported socio-demographics and completed the Center for Epidemiological Studies Depression Scale (CES-D) and Perceived Stress Scale. BMI was calculated from measured heights and weights. Multivariable models tested whether depressive symptoms predicted BMI. Predictors in the initial model were: depressive symptoms, ethnic group, and their interaction, and two covariates: perceived stress and income. Subsequent models were estimated to explore additional interactions between predictors. Results: Forty-four percent of mothers (66% of Haitians, 36% of Brazilians, 30% of Latinas) had high depressive symptoms (CES-D score ≥ 16). Seventy-one percent (83% of Haitians, 54% of Brazilians, 81% of Latinas) were overweight/obese (BMI ≥ 25). Depressive symptoms were associated with perceived stress (r=0.58, p<.0001) and income (r=0.19, p<.001). In the initial model, mothers higher on depressive symptoms tended to have higher BMI (p=0.07). With inclusion of significant interaction terms, a 3-way interaction between depression, ethnic group, and income was revealed (p<0.01), such that some subgroups (lower-income Brazilians; higher-income Latinas) showed an inverse association between depressive symptoms and BMI, in contrast to the overall trend. Conclusions: High levels of depressive symptoms and obesity among new immigrants are noteworthy, and links between them appear to vary by ethnic group and income.

T-589-P Report of an Intensive, Behavior Focused Management of Obesity
Taranveer K. Pawar, Theresa A. Piotrowski, David T. Martin, Richard Nesto Burlington, MA

Background: Current research is concentrated on the multifactorial causes, and reasons for perpetuation, of obesity. Few studies have reported outcomes from a practical therapy designed to account for such multiple factors in a medical setting. Methods: We report results of an intensive non-surgical treatment for obesity that included multidisciplinary providers. All consecutive patients referred to a medical weight loss clinic from January 2010 to December 2012 were retrospectively reviewed. Paired sample t-testing was used to compare baseline and 12 month data; linear mixed model analysis assessed outcomes over time. Results: Of 1202 consecutive patients, 51 were excluded due to missing data, leaving 1151, 585, 311, and 109 participants assessed outcomes over time. Results: Of 1202 consecutive patients, 51 were excluded due to missing data, leaving 1151, 585, 311, and 109 patients assessed at 0, 3, 6, and 12 months. Baseline data: 68.2% female, 92.5% Caucasian, mean (±SD) age 54.5±13), BMI 40.5±(7.5), weight 250.0 lbs.(±5.4), and fat mass 113.6 lbs.(±34.2). At 12 months, statistically significant (mean, 95% CI) reductions (p<0.001) were seen in BMI 4.0, (3.2 to 4.8) and fat mass 17.9 (13.6 to 22.3); with a low prevalence of weight re-gain (6%). Conclusions: A multidisciplinary clinical approach to non-surgical treatment for obesity included multidisciplinary providers. All consecutive patients referred to a medical weight loss clinic from January 2010 to December 2012 were retrospectively reviewed. Paired sample t-testing was used to compare baseline and 12 month data; linear mixed model analysis assessed outcomes over time. Results: Of 1202 consecutive patients, 51 were excluded due to missing data, leaving 1151, 585, 311, and 109 patients assessed at 0, 3, 6, and 12 months. Baseline data: 68.2% female, 92.5% Caucasian, mean (±SD) age 54.5±13), BMI 40.5±(7.5), weight 250.0 lbs.(±5.4), and fat mass 113.6 lbs.(±34.2). At 12 months, statistically significant (mean, 95% CI) reductions (p<0.001) were seen in BMI 4.0, (3.2 to 4.8) and fat mass 17.9 (13.6 to 22.3); with a low prevalence of weight re-gain (6%). Conclusions: A multidisciplinary clinical approach to non-surgical...
treatment in the morbidly obese population can lead to significant and sustained weight reduction in those adhering to therapy in the long-term.

**T-590-POT**

**Race and Variation in the Importance of Weight Stigma Relative to Other Quality of Life Domains among Obese Primary Care Patients and Patients Seeking Bariatric Surgery**
Christina C. Wee, Roger Davis, Mary Beth Hamel Boston, MA

**Background:** Obesity leads to adverse psychosocial effects. Scores on individual quality of life (QOL) domains do not necessarily indicate the relative importance of various domains to patients (pts); thus, the importance of psychosocial effects such as weight stigma relative to other QOL domains is unclear. *Methods:* We interviewed 338 primary care pts with a BMI >35 (58% response rate) and 574 pts seeking weight loss surgery (WLS) (70% response rate). We determined pts’ health utility (value pts attach to their current weight/health) via standard gamble scenarios assessing pts’ willingness to risk death to lose weight or achieve perfect health (0=death, 1=most valued health/weight state). We assessed associations between pts’ utility and QOL domains from the Impact of Weight on Quality of Life-lite separately, adjusting for age, education, and sex; public distress (weight stigma), self-esteem, physical function, work life, and sex life. We used Model R2s to identify the domain that explained the greatest variation in utility (devaluation of health state due to obesity). **Results:** The mean utility was 0.94 among primary care pts and 0.88 among WLS-seeking pts i.e. pts valued their current weight/health at 94% and 88% of their most valued state, respectively. Among primary care pts, the strongest correlate of utility was weight stigma for Caucasians pts, sex life for African Americans (AAs), and work life for Hispanics. Among pts seeking WLS, work life, weight stigma and physical function were comparably important for Caucasian pts; weight stigma was the strongest correlate in AAs, and weight stigma, sex life and work life were comparably important for Hispanics. **Conclusions:** Weight stigma appears to be important in pts’ devaluation of their current state among those seeking WLS and among Caucasian but not AA or Hispanic pts in primary care.

**T-591-P**

**Gender and the Importance of Weight Stigma and Other Quality of Life Domains among Obese Primary Care Patients and Patients Seeking Bariatric Surgery**
Christina C. Wee, Roger Davis, Mary Beth Hamel Boston, MA

**Background:** Obesity leads to quality of life (QOL) consequences that may vary by gender. Scores on individual QOL domains do not necessarily indicate the importance of the domain to patients (pts). *Methods:* We interviewed 338 primary care pts with a BMI >35 (58% response rate) and 574 pts seeking weight loss surgery (WLS) (70% response rate). We determined pts’ health utility (value pts attach to their current weight/health) via standard gamble scenarios assessing pts’ willingness to risk death to lose weight or achieve perfect health (range 0-1, 0=death and 1=most valued health/weight state). We then examined sex-specific associations between pts’ utility and the following domains from the Impact of Weight on Quality of Life-lite separately, adjusting for age, education, and race: public distress (weight stigma), self-esteem, physical function, work life, and sex life. We used Model R2s to identify domains that explained the greatest variation in utility.

**Results:** The mean utility was 0.97 among men and 0.93 among women primary care pts with obesity, and 0.85 and 0.88 among men and women seeking WLS i.e. pts valued their current weight/health 97%, 93%, 85%, and 88%, respectively, relative to their most valued state. Among primary care pts, individual QOL factors explained only a small amount of the variation in men’s utility, with sex life being the most important to men (3% of variation in utility); for women, weight stigma was the strongest correlate (5% of variation). Among pts seeking WLS, physical function (8% of variation) and weight stigma (6% of variation) were the strongest correlates for men and weight stigma (5% of variation) and work life (5% of variation) were the strongest correlates for women. **Conclusions:** Social stigma is the strongest determinant of the adverse effects of obesity on quality of life for women but not men.

**T-592-POT**

**Weight Disparities Among Transgender and Non-Transgender Young Adults**
Nicole VanKim, Melissa Laska, Darin J. Erickson, Katherine Lust, Marla Eisenberg, Simon Rosser Minneapolis, MN

**Background:** No population-based study to date has examined transgender disparities in weight behaviors. It is imperative to understand if transgender individuals experience adverse health related to weight. Furthermore, young adulthood is a critical age for addressing weight issues because of declines in positive weight behaviors. To address this research gap, the purpose of this study is to examine transgender disparities in weight and weight behaviors among young adults. *Methods:* Data were from the 2007-2011 College Student Health Survey, a population-based survey of 2- and 4-year Minnesota college students (n=34,324) attending 40 institutions. Cross-sectional, multivariate regression models, adjusted for clustering at the school level, were fit. Analyses compared transgender young adults (n=53) to non-transgender (i.e., identified as male or female) for 13 weight and weight behavior indicators. **Results:** Compared to non-transgender, transgender individuals were more likely to be either underweight [adjusted relative risk (95% CI)] 4.2 (1.4-12.3)] or obese [2.5 (1.2-4.9)] than normal weight, to not engage in 2.5 hours/week of strenuous physical activity [1.16 (1.01-1.34)], to not engage in any strengthening physical activity [1.3 (1.1-1.5)], and to spend 2 hours/day engaging in screen time [1.3 (1.0-1.5)]. There were no significant differences for fruit and vegetable, breakfast, soda, diet soda, fast food, and restaurant food consumption, moderate physical activity, unhealthy weight control, and body dissatisfaction. **Conclusions:** Findings indicate that transgender young adults may experience adverse health related to weight, physical activity, and screen time. This is the first population-based study to explore transgender disparities across a variety of weight-related indicators. Future work should build an understanding of the context of these disparities.

**T-593-P**

**Young Overweight and Obese Firefighters Don’t Receive Weight Recommendations**
Michelle L. Wilkinson, Austin L. Brown Houston, TX; Walter S. Poston, Christopher K. Haddock, Sara A. Jahnke Leawood, KS; R. S. Day Houston, TX

**Background:** National guidelines state health professionals should advise patients on the importance of maintaining a healthy weight. Firefighters have high rates of obesity and cardiovascular events are the leading cause of line of duty deaths in firefighters. No study has investigated the prevalence and predictors of weight recommendations for firefighters. This study assessed the impact of age and BMI on the occurrence of health professional weight recommendations among firefighters. *Methods:* Self-reported health professional recommendations were recorded as no advice, maintain, gain, or lose weight for a national sample of male firefighters (N=1002). Measured BMI was categorized as normal (<25.0kg/m²), overweight (25.0-29.9kg/m²), obese (30.0-34.9kg/m²), and severely obese (≥35.0kg/m²). The odds of receiving weight advice were estimated between age and BMI categories using multinomial regression. **Results:** Most firefighters (96.3%) reported visiting a physician in the past 12 months. The majority (69.1%) of all firefighters and nearly half (48.5%) of obese or severely obese firefighters reported receiving no advice about their weight. In general, higher levels of BMI predicted weight professional advice to lose weight. Interaction terms between age and BMI categories were statistically significant suggesting younger firefighters were less likely to receive health professional advice to lose weight than older firefighters, except among the severely obese. **Conclusions:** Healthcare providers are important sources of health information for firefighters. Still, overweight and obese firefighters do not consistently receive healthcare provider advice on weight, particularly in the youngest age group. This marks a missed opportunity to prevent further weight gain and reduce obesity related adverse health outcomes.
Longitudinally, easy-difficult temperament and mother-child dysfunctional interaction were significantly cross-sectionally associated with child eating behaviors, maternal feeding practices and mother-child interaction, child temperament, diet composition, maternal feeding practices, and mother-child dysfunctional interaction. Maternal pressure to eat and restrictive eating styles and maternal feeding practices questionnaires at T1. Mothers recruited at T1. Methods: This is a longitudinal observational study over 8 years (2005-2012) from a network of safety-net outpatient clinics in an urban community with electronic health records. Children were stratified based on BMI into weight status groups and followed for a minimum of 1 year but as long as 8 years. Secondary analysis, preparatory to a randomized controlled trial - Community Outreach: Obesity Prevention Trial. Results: Among children (N=33,542) the rate of overweight was 16% and rate of obesity was 18% at their last visit. Among these, 12,945 (36%) were followed for an average of 3.32 (+/-1.72) years to measure trends and change in weight status across early and late childhood. Before 6 years, 13% were overweight and 11% were obese. Children who were obese at 2-5 years had a nearly 70% chance of being obese between 6 and 11 years. The mean change in BMI z-score per person year of observation was 0.10 with increasing (and significant) change based on BMI category at last visit. Conclusions: Childhood obesity prevalence was high in this observational study. Progression to overweight and obesity between 2-5 years old and 6-11 years was substantial. A longitudinal measure for population-base monitoring of BMI z-score was consistent with empirical observations in this study.

Maternal and Child Predictors of Preschool Children's Eating and Body Mass Index: A Prospective Study

Heidi Bergmeier, Helen Skouteris, Sharon Horwood, Merrilyn Hooley, Ben Richardson Burwood, Australia

Background: Research has largely overlooked the role of child temperament implicated in the development of certain obesogenic risk factors and BMI of preschoolers. Hence, the overall aim of this study was to evaluate cross-sectional and prospective associations between child temperament, maternal feeding, maternal parenting styles, mother-child interaction, preschoolers’ eating behavior and BMI. Methods: Two-hundred and one mothers of 116 female and 85 male children aged between 2 and 5 years (M = 2.92, SD = 0.75) completed child temperament, eating behaviors, BMI, maternal parenting styles and maternal feeding practices questionnaires at T1. Mothers reported child BMI and eating behaviours again after one year. Results: Child irritability, cooperation-manageability and easy-difficult temperaments, mother-child dysfunctional interaction, maternal pressure to eat and restriction were significantly cross-sectionally associated with child eating behaviors. Child enjoyment of food was significantly associated with child BMI. Longitudinally, easy-difficult temperament and mother-child dysfunctional interaction predicted child eating behavior and baseline child BMI predicted child BMI after one year. Conclusions: The influence of the associations between child temperament, maternal practices and child eating behaviours on child weight status was not evident after one year, however, it is possible that this relationship could become more apparent as children’s early growth phases stabilise. Average maternal ratings of child temperament within this sample were relatively neutral, potentially explaining why most associations were not robust longitudinally. Future research should include a sample of greater socio-economic and BMI diversity as well as objective measures of child temperament, diet composition, maternal feeding practices, and mother-child interaction.

Social Support for Lifestyle Modification: What Adolescents Want from Family, Peers and Professionals

Bridget Buggs, Christina M. Smith, Joelyn Lebow, Kelly Harper, Christi Patten, Leslie Sim, Seema Kumar Rochester, MN

Background: Promotion of social support is a key aspect of effective behavioral modification programs for children and adults. For children, programs with parental involvement are more effective than those without. Adult programs show enhanced efficacy when social support promotion is a component. Relative to programs for children and adults, the development of effective programs for adolescents has lagged behind. Understanding better the unique developmental needs of adolescents is important for developing age appropriate and effective interventions for this age group. Methods: The current study utilized focus groups to identify adolescents’ social support preferences when making lifestyle changes for health or weight maintenance. Participants were 28 (50% female) adolescents ages 13-18 identified by medical record review as having had a BMI > 85th percentile within the last year. They participated in one of four age- and gender-stratified groups. Focus groups followed a structured format and data were analyzed following guidelines from Krueger & Casey (2000). Results: Results indicated that adolescents desire from family instrumental, emotional, companionship, and modeling support that focuses on the positive and supports their autonomy. From peers, adolescents seek companionship and emotional support. They wanted peers to be committed to healthful habits and voiced a need for environments to be safe from negative judgment. Adolescents demonstrated preliminary awareness of professionals as resources for establishing healthful habits. In addition to expecting expert information, adolescents spoke of the importance of a trusting relationship, regular follow up, and respect of autonomy and privacy from professionals. Conclusions: Adolescents raised important concepts to consider when developing interventions to promote healthy weight in this age group.

Association of Eating in the Absence of Hunger and Obesity Among College Mexican Students

María Eugenia Pérez-Morales, Montserrat Bacardí-Gascon, Luis A. Alcantara-Jurado, Ana Lilia Armendariz-Anguiano, Arturo Jimenez-Cruz Tijuana, Mexico

Background: Few studies have examined disinhibited eating behaviors in Mexico. Eating in the absence of hunger (EAH), defined as eating in response to the presence of palatable foods in the absence of physiological hunger, is one of the more frequently studied behaviors. The aim of this study
was to assess the association between obesity and eating in the absence of hunger among college students in Tijuana, Mexico. **Methods:** Two-hundred and one sophomore college students complete the Eating in Absence of hunger questionnaire (EAH-C). Weight, height, and waist circumference were assessed prior to beginning an after-school obesity prevention program at various community centers in Fort Worth, Texas. Forty-two percent were normal weight and 58% were overweight or obese. Youth completed a 24-hour dietary recall, and cumulative scores for Healthy Food (HF) and Unhealthy Food (UF) intake were obtained. Self-report surveys included confidence for increasing fruit/vegetable intake (FV) and for reducing fat intake (FAT), and intrinsic motivation for healthy eating (MOT). Differences between Hispanic and AA youth for HF, UF, MOT, FAT and FAT were analyzed using Mann-Whitney U. Relationships among variables were analyzed using Spearman correlation. Bonferroni correction was applied. **Results:** AA as compared to Hispanic youth reported less HF (p=0.003). Between group comparisons for other variables were non-significant. HF was correlated with FV for AA (r=0.395, p=0.003) and Hispanics (r=0.452, p=0.001), and with MOT for AA (r=0.419, p=0.002). All other correlations were non-significant. **Conclusions:** Among underserved youth, AA may be consuming much less healthy food than Hispanics. Although they did not differ in motivation or confidence for healthy eating, intake of healthy food appears highly related to degree of confidence for choosing fruits and vegetables for both groups. A focus on improvement in motivation also may be valuable in improving healthy food intake for AA. Results have implications for the development of culturally sensitive dietary interventions.

**T-599-PO**
Dietary Intake and Related Attitudes Toward Healthy Eating Differ between African-American and Hispanic Underserved Youth
Randi Profitt Leyva, Susan F. Franks Fort Worth, TX
**Background:** Underserved African American (AA) and Hispanic youth are disproportionally affected by obesity. This comparative study examined dietary intake and attitudes toward healthy food intake between AA and Hispanic underserved youth. **Methods:** Participants (n=112) ages 8 to 12 (X=9.21) were assessed prior to beginning an after-school obesity prevention program at various community centers in Fort Worth, Texas. Forty-two percent were normal weight and 58% were overweight or obese. Youth completed a 24-hour dietary recall, and cumulative scores for Healthy Food (HF) and Unhealthy Food (UF) intake were obtained. Self-report surveys included confidence for increasing fruit/vegetable intake (FV) and for reducing fat intake (FAT), and intrinsic motivation for healthy eating (MOT). Differences between Hispanic and AA youth for HF, UF, MOT, FAT and FAT were analyzed using Mann-Whitney U. Relationships among variables were analyzed using Spearman correlation. Bonferroni correction was applied. **Results:** AA as compared to Hispanic youth reported less HF (p=0.003). Between group comparisons for other variables were non-significant. HF was correlated with FV for AA (r=0.395, p=0.003) and Hispanics (r=0.452, p=0.001), and with MOT for AA (r=0.419, p=0.002). All other correlations were non-significant. **Conclusions:** Among underserved youth, AA may be consuming much less healthy food than Hispanics. Although they did not differ in motivation or confidence for healthy eating, intake of healthy food appears highly related to degree of confidence for choosing fruits and vegetables for both groups. A focus on improvement in motivation also may be valuable in improving healthy food intake for AA. Results have implications for the development of culturally sensitive dietary interventions.

**T-600-PO**
Purchasing Patterns of Adults, Adolescents and Children in Urban Corner Stores: Quantity, Spending and Nutritional Characteristics
Michelle R. Lent, Stephanie S. Vander Veur, Hannah G. Lawman, Giridhar Mallya, Tara Alexis McCoy, Timothy A. Sanders, Lisa Colby Philadelphia, PA; Judith Wylie-Rosett New York, NY; Gary D. Foster Philadelphia, PA
**Background:** Urban corner stores, also known as bodegas, are prevalent in low-income urban areas and primarily stock high calorie foods and beverages. Little is known about individual level purchases in these locations. The purpose of this study was to assess corner store purchases (items, nutritional characteristics and amount spent) of children, adolescents and adults in a low-income urban environment. **Methods:** Intercept surveys (n=9,238) directly examined food and beverage purchases of a large sample of adults, adolescents and children at 192 corner stores in Philadelphia from March-July 2013. **Results:** Among 7,928 intercept surveys, there were 2,244 items purchased. Shoppers overall spent $2.74±0.52 per visit. The average total number of calories purchased per corner store visit was 666.0±106.4 kcal for 2.2±2.1 items (1.3±2.0 food items and 0.9±0.9 beverage items). Beverage purchases occurred during 65.9% of intercepts and accounted for 39.2% of all items. Regular soda was the most popular beverage purchase (32.2% of intercepts, 29.7% of visits). High calorie foods accounted for a large portion of food items, including chips (17.9%), pastries (10.1%), and candy (7.9%). When data were examined by total items purchased or by intercept, the five most popular product categories remained the same (beverages, chips, prepared food items, pastries, and candy). Compared to children and adolescents, adults spent the most and purchased the most calories. **Conclusions:** Corner store purchases were low in cost and high in calories. Obesity prevention efforts may benefit from including interventions aimed at changing corner store food environments in low-income urban areas.
OBESITY 2013 ABSTRACT BOOK

POSTER ABSTRACTS – WEDNESDAY, NOVEMBER 13 to FRIDAY, NOVEMBER 15, 2013

T-603-DPT

Racial Differences in Health Related Quality of Life (HRQOL) in Obese and Severely Obese Adolescents

Background: Obesity has a deleterious effect on quality of life in youth. Black children are more likely than White children to be obese although attitudes about obesity are reportedly more tolerant in Black than White communities. The objectives of this study were to: (1) examine differences in generic and weight-related quality of life in severely obese youth a ≥7th vs. a ≥9th %ile; and (b) to examine racial differences in the above BMI categories.

Methods: In this cross-sectional study, 91 obese (BMI ≥7th/9th %ile) 133 severely obese (≥99th %ile) and 68 non-obese (BMI=85′th/90′th) youth and their parents completed the Pediatric Quality of Life Inventory (PedsQL) and the Impact of Weight on Quality of Life-Kids (IWQOL-kids). Youth were weighed and measured. Differences by BMI category and race in total and subscales for HRQOL were analyzed using ANOVA. Results: QOL scores were impaired in obese vs. non-obese youth. PedsQL (high score = worse QOL). QOL for BMI ≥99th %ile vs. ≥7th %ile was not significant. Emotional scores for Blacks ≥99th %ile/≥97th %ile 2.89/2.79 vs. Whites 5.29/3.88 p=0.01. Parents reported scores ≥99th %ile vs. ≥7th %ile for total 26.63/21.90, F=4.12, p=0.04; physical 9.92/7.13, F=7.34, p=0.007; and emotional 4.71/4.12, F=3.87, p=0.05 subscales. IWQOL (low score = worse QOL): Youth reported physical scores ≥99th %ile 22.86 vs. ≥97th %ile 25.50, F=10.17, p=0.001. Body esteem in Blacks vs. Whites ≥99th %ile 35.16/31.47, F=5.24, p=0.02, and ≥97th %ile 104.65/109.62, p=0.03, F=4.57. Parent reported physical scores in Blacks vs. Whites 22.85/25.60, F=14.66, p=0.001.

Conclusions: Parents reported significant impairments in QOL in severely obese youth compared with obese youth. Black youth reported better emotional functioning and body esteem. Additional supports are needed for severely obese youth and their parents.

T-604-P

New Media Use, Body Image and High Risk Health Behaviors among Overweight/Obese Females
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Background: New media approaches show promise for weight loss interventions. Recent data suggest that greater use of new media among adolescents might be related to high risk health behaviors, and higher body image dissatisfaction. However, these relationships have not been extensively studied among adults. Methods: This study examines new media use (social networking [SN], on-line role playing games [RPG], and online health information seeking [OHI]) among 128 overweight/obese women (Mage=34.10±8.15; race: 57.0% White; 25.8% Black; 10.2% Asian/Pacific Islander; 3.9% Hispanic/Latino; 3.1% other) interested in technology and weight loss. Participants reported smoking and alcohol use, body image dissatisfaction (Social Appearance Anxiety Scale and the Body Self-Esteem Scale for Adolescents), and binge eating (Eating Disorders Diagnostic Scale). Results: Use of new media: 87.5% (n=112) reported SN; 32.0% (n=41) played RPG; 85.2% (n=109) used OHI. Health behaviors: 43.8% reported binge behaviors, 27.3% reported smoking, and the average number of drinks per week was 3.54±5.5. For SN, alcohol use was higher (3.8drinks/wk±5.8) among users vs. nonusers (1.3drinks/wk±1.7; p<.001). For RPG, those who played had higher social anxiety (0.07±.17) p<.01 than those who did not play (4.2±1.5). All other comparisons were non-significant. Conclusions: Despite limitations (e.g., sample may have had interest and comfort in technology; information on use patterns was not available), this study offers information about new media use among adults, health behavior, and body dissatisfaction. It is possible that SN may normalize alcohol use among women, while RPG play may reinforce unrealistic body ideals and heighten appearance anxiety. Implications for intervention design and future directions for research will be discussed.

T-605-DPT

Family Nutrition/Physical Activity and Screening for Childhood Obesity Risk Reduction
Kathy S. James San Diego, CA; Panagiotis Matsangas Monterey, CA; Cynthia D. Connolly San Diego, CA

Background: Family dietary and nutritional behaviors may predispose children to obesity. The purpose of this study was to examine the feasibility and acceptability of a screening tool in identifying overweight children and offering family tips for healthy children in a time efficient manner that could likely be used in primary care settings. Methods: A cross section study using the Family Nutrition Physical Activity Tool (FNPA) was self administered by 98 overweight mothers identifying risk factors for childhood obesity. Participants were attending a weight loss clinic in southern California. Mothers completed a demographic and the 20 item screening survey with subscales on family meal patterns, family eating habits, food and beverage choices, restriction/reward, screen time behavior and monitoring, healthy environment, family and child activity involvement, and family routine. Participants completed the survey on paper or on online after consent was obtained. After completing the survey, a summary of recommended practices from the American Academy of Pediatrics was provided. Results: In the sample of parents with 172 children between 2-18, 37% of children were overweight or obese. Lower FNPA scores were associated with higher BMI, family income, race/ethnicity, education and mother’s BMI. Parents’ and children’s obesity risk was comparable to what is found in larger populations, whereas obesity in the age group between 2 and 5 years was doubled. Conclusions: It is feasible and acceptable for families to screen for risk for childhood obesity using the FNPA survey. Findings support maternal obesity is significant predictor for the development of child obesity. Health professionals can screen for childhood obesity risk and reinforce the importance of parent as role model.

T-606-DPT

Nutritional Knowledge Is Related to Self-Efficacy in Making Healthy Food Choice among College Students
Trias Mahmudiono, Bridget R. Byugust, Xiaofei Song, Nancy Muturi Manhattan, KS

Background: Obesity-related diseases cost the U.S. billions of dollars each year and prematurely end or diminish the quality of millions of Americans’ lives. People of low-income, including some college students, are disproportionately impacted by obesity. This research project was sought to identify the factors that contribute to food choices among low-income residents, particularly college students, with the goal of designing a communication campaign to improve healthy food choice behavior. Methods: This project is a cross sectional study that surveyed 110 college students in Mid-Western University using a structured questionnaire that measured key variables that were derived from the Social Cognitive Theory. Results: The results show that many college students have high nutritional knowledge and self-efficacy, but lacked awareness of available, budget-friendly healthy food choices and did not believe they could afford healthy food choices. Most students also agreed that they sometimes made food choices even though they knew they were unhealthy. Chi-square test confirmed that there is a significant correlation between respondents’ MyPlate awareness and nutritional knowledge (p=0.001) as well as nutritional knowledge and self-efficacy (p=0.022). Nearly 85% of student respondents indicated that they had home access to the internet as their primary source of health and nutrition knowledge. Conclusions: In conclusion, improving nutritional knowledge especially in regards to access to cheaper healthy food option on campus is important to boost students’ self-efficacy. The study recommends an online awareness campaign to promote affordable healthy food choices for college students and encourage them to make healthy food choices more frequently.

T-607-DPT

Evaluating Healthy Growth Among WIC Infants: A Qualitative Review
Angela Valenica, Barris Duncan, Andrew Arthur, Laurie Robinson, Lilian Romero, Jennifer Peters, Cynthia Thomon Tucson, AZ

Background: Childhood obesity is a serious public health problem affecting 10% of 2 y olds and > 20% of 5 y olds and even higher percentages of Hispanics and Native Americans. Early age onset obesity is associated with higher risk for physical and psychological problems in childhood and obe-
sity-related chronic disease in adulthood. The overall objective of this project was to assess knowledge, attitudes, and behaviors of WIC staff and WIC moms regarding weight evaluations for infants and toddlers and to evaluate the acceptability and feasibility of growth charts as a tool to monitor infants' growth longitudinally. **Methods:** A mixed-method included quantitative questionnaires and qualitative interviews with WIC staff (n=6) and focus groups with WIC moms (n=25). Content analysis (NVivo software) and data triangulation were performed to identify themes/patterns of response. **Results:** Mean age of focus group participants was 35y (range: 19-63y); 88% Latino; 72% were born in Mexico. Qualitative themes from interviews and focus groups included concern for overweight status, limited conversations between mothers and health care providers regarding overweight status, and infant feeding practices and beliefs that may contribute to feeding behavior associated with greater risk for excess weight gain in early infancy. Growth charts were well received, but effectiveness of growth plotting may be limited without the provision of culturally sensitive education regarding healthy growth and growth monitoring among Latino moms. **Conclusions:** An educational intervention teaching mothers how to plot and interpret growth using growth charts is acceptable and feasible. Whether such efforts will prevent excess weight gain in early childhood is yet to be determined.

**T-608-P**

**Predicting Success in Weight-Management Based on Decision-Making Style**

Gilly Koritzky, Camille Dieiterle, Chantelle Rice, Katie Jordan, Antoine Bechara

**Los Angeles, CA**

**Background:** Behavioral interventions to treat obesity, i.e., weight management programs, are highly limited in their success. Evidently, there is a pressing need to understand the underlying factors of successful weight-management, in order to design more effective interventions. Evidence associating impaired decision-making with the persistence or complication of obesity is mixed. We applied a more refined approach, looking into differences in the types of decision-making impairments found in obese individuals. We hypothesized that compared to unsuccessful dieters, successful dieters are less influenced by recent information at the expense of relying on their full past experience. This tendency is measured by the Expectancy Valence (EV) model: a paradigm for estimating individual differences in several underlying components of decision-making. **Methods:** Subjects (N=40, 70% female, mean age 44 yrs) completed a weight-management program. Mean initial weight was 198.66 lbs and mean BMI was 32.6. For 16 weeks, participants met weekly with a therapist and received information and dietary guidance. **Success** was defined as losing at least 5% of initial weight. In the beginning of the program, participants completed a laboratory decision-making task, whose results were analyzed using the EV model. **Results:** Only 26% of the participants were successful in losing weight. Successful and unsuccessful participants did not differ in initial BMI, age, or other demographic variables. As hypothesized, successful dieters were less likely than unsuccessful dieters to be influenced by recent information at the expense of relying on past experience (p<0.05). **Conclusions:** These results advance our understanding of the cognitive processes associated with successful weight-loss, and suggest that improving decision-making can foster better results among dieters.

**T-609-P**

**Racial Disparities in Sugary Drink Consumption in Preschool Children in Louisiana**

Tung Sung Tseng, Marc Bonis, Maura Mohler, Amanda Arguello, Julia Volaufova, Ann Clesi, Leslie Lewis, Melinda S. Sothern

**New Orleans, LA**

**Background:** In US children aged 2-5 years, the prevalence of obesity has increased from 5% in 1970 to 14.4% in 2010. The association between consumption of sugary drinks and obesity has been confirmed. We investigated sugary drink consumption behaviors between black and white preschool-aged children in Louisiana, and examined the relationship between obesity and sugary drink consumption. **Methods:** Data was collected from baseline measurements of 145 children, aged 2-5 years participating in the Nutrition and Physical Activity Self-Assessment for Child Care, which aimed to improve the environment and policies, and patient-staff interaction in childcare centers in Louisiana in order to prevent obesity. Children’s sugary drink and fruit juice intake was measured by parent report using a Harvard Children’s Nutrition Questionnaire. Baseline height and weight were measured and converted to BMI percentile and BMI z score. The chi-square, fisher’s exact test, and t-test were used to analyze data. **Results:** Participants were predominantly white (54.1%) with 51.2% females. 12.5% of participants were obese. Black children consumed more sugary drinks than white children (76.92% vs. 48.15%) especially black boys (91.67% vs. black girls 64.29%, white girls 51.85%, and white boys 44.44%). However, no significant differences were identified in consumption of orange juice, and other juices. **Conclusions:** Black preschool children within child care centers in Louisiana have the highest consumption of sugary drinks. Therefore, efforts to prevent obesity among black preschool children should include interventions to reduce consumption of sugary drinks.
women. BE that does not rise to the level of BED appears to be present in normal and over weight students. Gender should be a consideration in future studies of binge eating, emotion and weight.

T-612-P
Obesity and Its Comorbidities Three-Dimensional Didactical Model
Mario O. Morales Suarez, Raul Morin, Adriana Madero, Mario Octavio Morales Suarez, Juan R. Romero Mexico DF, Mexico

Background: Overweight and obesity are a public health problem and their comorbidities, alas biological constraints, generate an important economic burden to the individual, the family and the health authorities. Ignorance and lack of right information are paramount causes in the genesis of the disease.

Methods: We built this three-dimensional anatomical model as an educational tool to show patients in a comprehensive way the morphological changes that arise as a consequence of being overweight or obese. Results: Encourage the doctor involved in the bonding process and cultural awareness, moral and behavioral through health education Conclusions: Improving all aspects of the quality of education for patients to get results in health improvement

T-613-PDT
Food Intimacy: A Parental Perspective of Eating Behaviors in Obese Pre-Adolescents
Jennifer S. Laurent Burlington, VT

Background: Disordered eating behaviors are implicated in the development and persistence of obesity in childhood, adolescence, and adulthood. The purpose of this study was to provide a qualitative perspective of obese youth’s eating behaviors through the lens of their parent as they attempt to create healthy changes. Methods: In-depth secondary analysis of the concept of food intimacy that evolved as part of a larger study investigating how parents promote health for their obese child. Seventeen parents of 10-14 year old obese youth were interviewed. Themes and concepts were developed using grounded theory. Results: Parents described child behaviors such as losing control and sneaky eating to obtain food, as well as using food for comfort, pleasure, and simply loving food. The relationship between these children and food was identified as the overarching theme, food intimacy. Food intimacy evolved as a third party relationship (child-food-parent) that was perceived by parents as a significant barrier to creating healthful changes for their obese child. Conclusions: This study highlights the intimate relationship these children developed with food and the powerful influence of this relationship on their eating behaviors. This suggests that prescribed interventions such as exercising more and eating less may be ineffective in certain obese children, and that more focus should be placed on investigating the relationship an obese child has with food.

T-614-P
Preliminary Support for the Identification of Food Addiction in Obese Youth
Jennifer S. Laurent, Amy Nickerson, David Brock, Connie L. Tompkins Burlington, VT

Background: Increasing evidence implicates food addiction in the development and persistence of obesity in adults but has yet to be characterized in obese youth. Methods: Upon entry into the REWARD Teens multi-disciplinary program, >15% of children were obese. Upon entry into the REWARD Teens multi-disciplinary program, ≥95th BMI percentile youth, BMI as a motivator. Convergent strategies among positive outlier families resulted in reduction of BMI and medication use.

T-615-P
Children’s Power of Food Scale: Psychometric Properties in a Diverse Sample of Pre-Adolescents
Jennifer S. Laurent Burlington, VT

Background: The Children’s Power of Food Scale measures appetitive responsiveness across three domains, food available but not tasted, food tasted but not eaten, and a total aggregate score. Although validated in adult populations it has not been tested in youth. Methods: 47 ethnically diverse 10-14 year old youths were sampled for this methodological study to establish reliability. 6 content experts were recruited to establish content validity (CVI). Results: 2-week test-retest followed by a 2-week period of no testing to limit the influence of homeostatic hunger on responses. Internal consistency within each factor at each time point demonstrated a Cronbach’s α ranging from 0.61-0.89. Intra-class correlation coefficients for the reliability of factor scores were 0.68 for factor 1, 0.28 for factor 2, and 0.61 for factor 3, and 0.55 for the aggregate scale. Factor 2 increased to 0.43 when analysis was limited to English as primary language. Quadratic weighted mean kappa (κ) ranged from 0.19 to 0.69 for individual questions. Mean kappa was 0.41 and median was 0.44. CVI index was 0.87. Conclusions: This study suggests that C-PFS is an adequate measure of appetitive responsiveness in 10-14 year olds in food abundant environments. Factor 2 should be interpreted with caution in English language learners and further inquiry should examine the temporal stability of the food present but not tasted construct. The C-PFS may serve as useful instrument to identify youth more vulnerable to food preoccupation and overconsumption given the obesogenic food environment.

T-616-PDT
Outcomes from Positive Outliers in Childhood Obesity
Gareth Marshall, Mona Sharifi Boston, MA; Roberta E. Goldman Providence, RI; Christine M. Horan, Renata L. Koziol, Stephanie Fersimon, Richard Marshall, Thomas Sequist, Elsie M. Taveras Boston, MA

Background: Successful strategies to inform obesity interventions and reduce disparities can be found among “positive outliers,” i.e., individuals who have succeeded where others have not in reducing BMI and developing resilience in adverse built and social environments. We explored perspectives and strategies of parents whose children have improved their BMI despite living in high risk neighborhoods. Methods: We collected height/weight from the previous four years of electronic health records for 22,657 children age 6-12 seen for well-child care in Massachusetts from August 2011-August 2012. We identified obese children (BMI ≥95th percentile) and defined obesity “hotspot” zip codes where ≥15% of children were obese. We generated a BMI z-score slope for each child using a linear mixed effects model. From the sub-sample with negative slopes living in hotspots, we recruited parents for focus groups. We analyzed group transcripts and discussed emerging themes in iterative meetings using an immersion/crystallization approach. Results: We reached thematic saturation after 5 focus groups with 41 parents of diverse education and racial/ethnic backgrounds. Commonly cited outcomes that mattered most to parents and motivated change were child inactivity, clothing size, exercise intolerance, and peer comparisons; few reported BMI as a motivator. Convergent strategies among positive outlier families were family-level changes, parent modeling, consistency, household rules/limits, and creativity in overcoming resistance. Parents voiced preferences for obesity interventions that include tailored education and support that extends outside clinical settings and is delivered by both health care professionals and successful peers. Conclusions: Successful strategies learned from positive outlier families can be generalized and promoted to accelerate progress in childhood obesity.

T-617-P
Self-Regulatory Traits as Predictors of Dietary Behavior among Overweight/Obese Adults Enrolled in a Weight Loss Program
Kerstin E. Schroder, Stephanie M. Mathis Birmingham, AL

Background: Trait factors are rarely considered as predictors of dietary behavior in help-seeking individuals such as participants enrolled in a weight
loss program. However, several health behavior models suggest that self-regulatory traits may impact health-related behaviors both by affecting self-control of health behavior and through coping with stress and failure. In this study, we assess the associations between trait anger, self-control, and coping competence on food consumption patterns among 91 overweight/obese participants of a diet-based weight loss program. Methods: Participants completed a survey assessing trait predictors and binge eating three times in 3-month intervals using well-validated instruments. Further, we collected 8-day pre-intervention food diaries and post-intervention food records using a Nutrition Software. Food records were analyzed for macronutrient content, and daily average consumption was calculated as the % of the recommended dietary allowance (RDA) using age, gender, height, weight, and self-reported activity level and a target BMI of 25 as reference point. Correlational and multiple linear regression analyses were conducted, controlling for age, gender, and dieting self-efficacy beliefs. Results: In all cross-sectional and most prospective analyses, trait predictors were significantly related to bingeing (r = .25) to .51), % kcal consumption (r = .16 to .38), and % carbohydrate intake (r = .25) to .45). Only emotion regulation variables (anger or coping competence) remained significant in multiple regressions, explaining between 4% and 7.4% of incremental variance in cross-sectional and 9.6% to 11.6% of incremental variance in 2 out of 4 longitudinal analyses. Conclusions: Emotion regulation variables should receive more attention in future weight loss intervention research with overweight/obese populations.

T-618-P
Do Symptoms of Depression Mediate the Relationship between Childhood Adversity and Night Eating? Genna Hymowitz, Jessica Salwen Stony Brook, NY

Background: Night eating syndrome (NES) is characterized by morning anorexia, excessive hunger in the evening, insomnia, and snacking during nighttime awakenings, and associated with weight difficulties and poorer weight loss in individuals undergoing treatment for obesity. Previous research demonstrated relationships between childhood adversity and NES, NES and depressive symptoms, and childhood adversity and depression. Few studies have investigated the role of depression in the relationship between childhood adversity and NES. Moreover, little is known regarding NES symptoms in a non-obese sample. Methods: We evaluated the following hypotheses: 1) childhood emotional abuse (EA) predicts symptoms of NES, and 2) symptoms of depression mediate the relationship between EA and symptoms of NES, in a sample of 277 undergraduate students (ages 17-36) who completed online and paper and pencil surveys assessing childhood adversity, eating patterns and psychological symptoms. Results: Both hypotheses were supported. EA significantly predicted severity of NES symptoms (β = .36, t (277) = 6.46, p < .001). EA significantly predicted symptoms of depression (β = .45, t(277) = 8.42, p < .001). Symptoms of depression predicted NES symptoms controlling for EA (β = .34, t (277) = 5.67, p < .001). Bootstrap analyses indicated a statistically significant indirect effect of EA through depression (95% CI: 1.15, 4.33). Conclusions: Results suggest that depressive symptoms mediate the relationship between childhood emotional abuse and symptoms of NES. Thus, it is important to assess NES symptoms in individuals with depression, and it may be beneficial to address symptoms of depression when treating individuals presenting with NES.

T-619-P
A Novel Delayed Discounting Task Reveals Correlations between Impulsivity, Percent Body Fat and Self-Reported Eating Behavior in Obese and Lean Adults Valerie Darcey Washington, DC; Juen Guo, Kevin D. Hall Bethesda, MD

Background: Obesity treatment often pits immediate food rewards against the delayed rewards associated with weight loss. Methods: To investigate how delayed rewards are discounted in comparison to immediately available rewards, we studied a group of Lean (12M/9F, BMI-22.5 ± 2.7 kg/m², body fat=23.4 ± 8.6%) and Obese (8M/6F, BMI-36.5 ± 4.9 kg/m², body fat=41.0 ± 9.8%) subjects using a computerized delay discounting task, performed 1.5h after a standard meal. Subjects indicated their preference for hypothetical fixed immediate rewards ($2.50 or salient food) versus a mostly larger, monetary reward ($1 - $100) available after a variable delay (now-3 years) presented in random order. The immediate food reward was subject-specific, selected as the highest rated item on a liking/wanting task. Reaction time-weighted responses were used to calculate indifference points for each delay and the area under the indifference curve (AUC) was calculated for both commodities. A smaller AUC indicates a preference for the immediate reward and is an index of impulsivity. Results: AUC and AUCmed were correlated (r=0.55, p=0.008) but were not significantly different between groups for either AUC (p=0.18) or AUCmed (p=0.37). BMI was not related to either AUC measure, but there was an indication of greater impulsivity for monetary rewards (decreased AUC) in subjects with higher % body fat (r=0.4, p=0.053). Both Disinhibition and Hunger on the Three Factor Eating Questionnaire were significantly greater in the obese group (p=0.001 and p=0.04, respectively), but were not related to discounting for either commodity. In contrast, Cognitive Restraint was correlated with both AUC (r=0.63, p=0.003) and AUCmed (r=0.5, p=0.028). Conclusions: These results suggest that individuals reporting greater Cognitive Restraint over eating also display greater ability to delay gratification.

T-620-P
Perinatal Exposure to High-Fat Diet Increases the Risk of Offspring Developing Behavioral Disorders Elinor Sullivan, Elizabeth Nousen, Juliana Franco, Kevin Grove Beaverton, OR

Background: Prevalence of pediatric neuropsychiatric disorders has dramatically increased during the past decade propelled largely by increased incidence of Autism Spectrum Disorders and Attention Deficit Hyperactivity Disorders. The underlying causes of these disorders remain elusive; however, there is evidence that the environment encountered during fetal development has a considerable influence on the risk of these disorders. As maternal obesity increases placental inflammation and the delivery of inflammatory cytokines to the fetus, we hypothesize that exposure to maternal obesity and its metabolic complications impact the development of neural circuits critical in behavioral regulation, which subsequently alters behavior. Methods: We used a non-human primate model of diet-induced obesity to examine the consequences of maternal obesity and high-fat diet (HFD) consumption on the central serotonin system and behavioral response of offspring. Female Japanese macaques consuming either a low fat diet (13% of calories from fat) or a HFD (36% calories from fat) and their juvenile offspring were examined. Responses to novel items and social situations were analyzed. In situ hybridization was used to assess the serotonin system in the dorsal raphe. Results: HFD offspring display behavioral abnormalities that mimic features of neurodevelopmental disorders including social withdrawal, increased aggression in response to a novel peer, increased anxiety in response to a novel object, and reduced exploratory and reduced novelty seeking. These offspring also displayed increased placental inflammation and the delivery of inflammatory cytokines to the fetus, we hypothesize that exposure to maternal obesity and its metabolic complications impact the development of neural circuits critical in behavioral regulation, which subsequently alters behavior. Methods: We used a non-human primate model of diet-induced obesity to examine the consequences of maternal obesity and high-fat diet (HFD) consumption on the central serotonin system and behavioral response of offspring. Female Japanese macaques consuming either a low fat diet (13% of calories from fat) or a HFD (36% calories from fat) and their juvenile offspring were examined. Responses to novel items and social situations were analyzed. In situ hybridization was used to assess the serotonin system in the dorsal raphe. Results: HFD offspring display behavioral abnormalities that mimic features of neurodevelopmental disorders including social withdrawal, increased aggression in response to a novel peer, increased anxiety in response to a novel object, and reduced exploratory and reduced novelty seeking. These offspring also displayed increased placental inflammation and the delivery of inflammatory cytokines to the fetus, we hypothesize that exposure to maternal obesity and its metabolic complications impact the development of neural circuits critical in behavioral regulation, which subsequently alters behavior.

T-621-PD
Inadequate Nutrient Intake in Obese People with Serious Mental Illness Laura K. Barre, Stephen J. Bartels Lebanon, NH

Background: Nutritional deficiencies have been identified in the morbidly obese. People with serious mental illness are twice as likely as the general population to be obese and more likely to be morbidly obese (body mass index ≥ 40kg/m²). We explored the nutritional adequacy of the diet of obese people with serious mental illness. Methods: Cross sectional analysis of baseline data on 209 obese persons with serious mental illness enrolled in a healthy lifestyle intervention. Participants had a diagnosis of major depression (15%), bipolar disorder (29%), or schizophrenia spectrum disorder (56%). Nutritional intake from diet and supplements in the past month was obtained with the Block Food Frequency Questionnaire. We calculated the percentage of participants meeting the U.S. Department of Agriculture Dietary Reference Intakes for vitamins and minerals stratifying by gender. Results: Examples of nutrients meeting the RDA for vitamins and minerals stratifying by gender. Obstivory 2013 Abstract Book

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For author conflict of interest information, see page S264

S195
T-622-P
Use of an American Board of Pediatrics’ Maintenance of Certification (MOC) to Improve Counseling for Weight Management at Well-Child Check-Ups
Stephanie Walsh, Holly Sealer, Elizabeth Hogan, Wendy Palmer, Brad Weselman, Tom Fimmerty, Trisha Hardy, Jean A. Welsh, Miriam B. Vos, Wendy H. Greenberg, Atlanta, GA
Background: Participation in approved Maintenance of Certification (MOC) programs is now required for all American Board of Pediatrics certified physicians. We evaluated the impact on physician practices of an MOC program designed to encourage the use of evidenced-based, patient-centered counseling to promote healthy diets and physical activity among children and their parents. Methods: 67 pediatricians from 7 practices enrolled in the Strong4Life MOC program and agreed to: 1) attend training (a 2-hour baseline and 1-hour on-line refresher), 2) inform their staff about the MOC, and 3) participate in a peer-review of patient charts. One month before and 6 months after training were reviewed (15 charts per physician per time point) to assess prevalence of: counseling related to key healthy diet and physical activity habits; BMI percentile plotting; and wellness goal-setting. Results: Frequency of counseling about eating and intake of sweet drinks and fruits and vegetables increased from 9%, 28%, and 41%, respectively, before training to 93%-98%, 94%-97%, and 96%-98%, 3 and 6 months after training. Counseling about daily physical activity and screen time were 72% and 76%, respectively, at baseline and increased to 94%-98% at 3- and 6-month follow-up. BMI plotting was high at all three timepoints (99%-100%). Wellness goals were documented for 12% of patients at baseline, 87% at 3 months and 91% at 6 months. Conclusions: Pediatrician participation in an MOC designed to promote patient-centered counseling for healthy diet and physical activity behaviors resulted in a rapid and sustained improvement in counseling practices.

T-623-P
Factors Associated with Parental Misclassification of Their Overweight Child’s Bodyweight: A Cross-Sectional Study in the State of Georgia
Jean A. Welsh, Scott Gillespie, Courtney McCracken, Miriam B. Vos, Atlanta, GA
Background: Research has shown that parents often misclassify the weight status of their overweight children. The purpose of this study was to identify factors associated with this misclassification among parents living in the state of Georgia. Methods: A telephone survey of parents of normal weight or obese children age 6–15 years (n=1411) throughout Georgia was conducted in November 2012. Quota sampling was done to enable subgroup analyses by: child’s weight status based on parent reported weight and height (BMI <85th percentile [normal weight] or BMI ≥95th percentile [obese]), race/ethnicity (Hispanic or white, black, other), and income (<$50,000 vs. >$50,000 annually). Parents were asked to categorize their child’s weight status as “underweight”, “normal weight”, “overweight”, or “extremely overweight or obese”. Multiple logistic regression was used to identify factors affecting the odds of parents correctly identifying their child’s weight status. Results: 22.8% of parents identified their child as under or normal weight while their BMI score indicated overweight or obesity. The odds of a parent correctly classifying their child’s weight were greater in higher (≥ $50,000) vs. lower (< $50,000) income families, OR = 1.6 (95% CI: 1.2 – 2.0); odds of a parent correctly classifying their child’s weight were lower in non-Hispanic Blacks and Hispanics relative to non-Hispanic whites, OR = 0.51 (95% CI: 0.38 – 0.68) and OR = 0.44 (95% CI: 0.26 – 0.76), respectively. Conclusions: Non-Hispanic White parents and households with higher incomes were more adept at gauging their child’s weight, relative to non Hispanic Black and Hispanic parents and households with lower incomes, respectively.

T-624-P
Inadequate Physical Activity and Health Care Expenditures in the United States
Susan A. Carlson, Janet Fulton, Michael Pratt, Zhou Yang, E. Kathleen Adams, Atlanta, GA
Background: The 2008 Physical Activity Guidelines for Americans recommend that for substantial health benefits, adults should participate weekly in at least 150 minutes of moderate-intensity equivalent physical activity. This study examines health care expenditures in the U.S. associated with inadequate levels of physical activity. Methods: Physical activity data from the National Health Interview Survey (2004-2009) were merged with health care expenditure data for the next 1 to 2 years from the Medical Expenditure Panel Survey (2006-2010) for adults (≥20 years), excluding those pregnant, underweight, or who reported being unable to do physical activity (N=41,992). Physical activity was classified as: active (≥150 mmw/wk moderate-intensity equivalent activity); insufficiently active (some activity but not enough to meet active definition); or inactive (no leisure-time activity). Mean differences in expenditures for those inactive and insufficiently active compared to active were estimated using a 4-part multivariate econometric model. Results: Mean difference (compared to active and adjusting for covariates) in health care expenditures per capita was $1382 (95% CI: 917, 1846) for those inactive and $804 (95% CI: 399, 1209) for those insufficiently active. After adjusting for BMI, the mean difference for those inactive was $1259 (95% CI: 789, 1729) and $680 (95% CI: 285, 1075) for those insufficiently active. About 13.1% of aggregate health care expenditures were associated with inadequate physical activity, 11.7% after adding BMI to the model, and 10.2% after adding difficulty walking. Conclusions: Inadequate physical activity is associated with a significant percentage of health care expenditures. Increasing adults’ physical activity to meet guidelines has the potential to reduce health care expenditures in the U.S.
T-628-P
Cut-Points of Muscle Strength Associated with Metabolic Syndrome in Men in the Aerobics Center Longitudinal Study
Martin Sénéchal, Jonathan M. McGavock Winnepeg, Canada; Timothy Church Baton Rouge, LA; Duck-Chul Lee Ames, IA; Xuemei Sui, Steven N. Blair Columbia, SC; Conrad Earnest Claverdon Down, United Kingdom

Background: The loss of muscle strength with age increases the likelihood of metabolic syndrome (MetS). However, the minimal threshold of muscle strength at which the risk for MetS increases is unclear. The objective of this study was to identify a threshold of muscle strength associated with MetS in men.

Methods: We created receiver-operating curves for muscle strength and the risk of MetS from a cross-sectional sample of 5685 men aged < 50 years and 1541 men aged ≥ 50 years. The MetS was defined according to the NCEP ATPIII criteria. Upper and lower muscle strength was determined from 1-RM tests on bench and leg press.

Results: MetS was evident in 23% of men and was less common among men < 50 years compared with men aged ≥ 50 years (20.7% vs. 31.6%; P < 0.01). In men aged < 50 years, the odds of MetS were 2.20 fold (95%CI 1.89-2.54) higher in those with low muscle strength, independent of age, smoking, and alcohol intake. The strength of this association was further enhanced for men aged ≥ 50 years (2.11 95%CI: 1.62-2.74). In men aged < 50 years, the thresholds associated with MetS were 1.29 kg/kg body weight and 2.02 kg/kg body weight for bench press and leg press, respectively. In men aged 50 years these thresholds were 0.71 kg/kg body weight and 1.67 kg/kg body weight, respectively. Conclusions: This study is the first to identify a threshold of muscle strength associated with an increased likelihood of MetS in men. Our results may help tailor resistance training programs for chronic disease management in men.

T-627-DPT
Physical Activity Patterns in the U.S., Jamaica and 3 African Countries
Lara B. Dugas Maywood, IL; Pascal Bovet Lausanne, Switzerland; Terrence Forrester Kingston, Jamaica; Estelle Lambert Cape Town, South Africa; Jacob Plange-Rhule Kumasi, Ghana; Ramon A. Durazo-Arvizu, David A. Shoham, Guichan Cao Maywood, IL; Dale A. Schoeller Wisconsin, WI; Richard S. Cooper Maywood, IL; Soren Brage, Ulf Ekeland Cambridge, United Kingdom; Amy Luke Maywood, IL

Background: Obesity varies significantly between developing and developed countries, due in part, to differences in socio-economic status (SES). The Modeling the Epidemiologic Transition Study (METS) is a longitudinal study, in 5 countries spanning the epidemiologic transition. Methods: METS seeks to define the association between physical activity (PA), obesity and CVD risk in populations of African origin: Ghana (GH), South Africa (SA), Seychelles (SEY), Jamaica (JA) and the US (suburban Chicago). Baseline measurements of objective PA, SES, anthropometrics and body composition, were completed on 2500 men and women, aged 25-45 years. PA (min/d) was measured from objective PA, SES, anthropometrics and body composition, were completed on 2500 men and women, aged 25-45 years. PA (min/d) was measured from accelerometer data. Comparisons were completed between these populations and the US.

Results: Among the men, obesity prevalence reflected the level of economic transition and was lowest in GH (1.7%) and SA (4.8%) and highest in the US (41%). SA (55%) and US (65%) women had the highest levels of obesity, compared to only 16% in GH. More men and women in developing countries engaged in manual labor and this was reflected by dramatic differences in BMI between SA, JA, SEY and US. MPA most doubling of measured MPV A among the men in GH (45 min/d) and SA (47 min/d) compared to only 28 min/d in the US. Women in GH (25 min/d), SA (21 min/d), JA (20 min/d) and SEY (20 min/d) accumulated significantly more MPVA than women in the US (14 min/d) yet this difference was not reflected by dramatic differences in BMI between SA, JA, SEY and US. MPA constituted the bulk of the PA, with no countries except SA men accumulating > 5 min/d of VPA. Among the women, no sites accumulated ≥2 min/d of VPA. Overweight/obese men were 22% less likely to engage in manual occupations. Conclusions: While there is some association for PA with obesity, the relationship is inconsistent across the epidemiologic transition and suggests that PA policy recommendations should be tailored for each environment.

T-628-P
Temporal Patterns in Accelerometer-Measured Physical Activity among U.S. Youth: Differences by Weight Status
Britni R. Belcher, Erin Hennessy, Frank M. Perna, James McClain Bethesda, MD

Methods: Youth physical activity (PA) differs by weight status. Less is known about the relationship of weight status and within-day temporal PA patterns

Methods: Youth (6-19 years) from the 2003-6 National Health and Nutrition Examination Surveys with at least one 10-hour weekday of accelerometer data were included (n=4852; 50% male). Temporal patterns were represented by segments that broadly reflect before (6-9am), during (9am-3pm), after school (3-6pm), and evening (6-9pm) time. Weight status groups were: normal (5th-84th %ile), overweight (85th-94th %ile), and obese (95th %ile). Statistics for mean counts per minute (cpm) were expressed as daily cpm, and for each time segment across all valid weekdays. Covariates were age, race/ethnicity, and sex. Sample weights accounted for the complex survey design. Results: Compared to normal weight [mean cpm(SE)=299(9.40)] and overweight [mean cpm(SE)=274(3.60)] youth, obese youth [mean cpm(SE)=257(9.47)] had a lower mean count rate across weekdays (p<.05 for all comparisons). From 6-9am, the count rate for overweight youth was higher than obese youth [mean cpm(SE)=212.7(15.1) vs. 186.5(11.5); p<.05]. From 9am-3pm, the count rate for normal weight youth was higher than obese youth [mean cpm(SE)=543.1(6.3) vs. 402.4(9.8); p<.05]. The largest significant rate differences between normal weight and obese youth occurred from 3-6pm [mean cpm(SE)=627.7(11.6) vs. 504.9(13.4); p<.05] and from 6-9pm [mean cpm(SE)=506.7(15.2) vs. 414.7(15.4); p<.05]. Patterns and relationships were similar by sex.

Conclusions: Accelerometer count rate is highest in normal weight vs. overweight and obese youth throughout the day, with the greatest differences occurring between 3-6pm. Temporal analyses of accelerometer data provide a more complete profile of youth PA to inform future intervention targets and strategies.

T-629-P
Relationship between Sleep Characteristics and Adiposity in a Nationally-Representative Sample
Qian Xiao, Charles E. Matthews Rockville, MD

Background: Sleep is a multidimensional behavior that cannot be characterized solely by sleep duration. Other sleep characteristics, such as sleep latency, disturbances, fragmentation, and overall quality, may also influence obesity. In a nationally-representative sample, we evaluated various aspects of sleep in relation to adiposity. Methods: Participants in 2005-2006 Nhanes who were 20 or older with information on sleep and body composition were included (N=4503). Sleep characteristics were self-reported, weight, height and waist circumference were measured and fat mass was determined by dual-energy X-ray absorptiometry (DXA). The association between sleep and adiposity were examined using linear regression models adjusted for confounders and Nhanes sampling procedures. Additionally, we simultaneously entered all the sleep variables that were significantly associated with adiposity in a model to evaluate their independent effects. Results: People who reported <6 hr sleep, sleepy during the day, snoring and ever diagnosed with sleep disorder had significantly higher BMI, waist circumference, and fat mass. Trouble falling asleep, nighttime arousal and waking too early were not associated with adiposity measures. Sleep duration, snoring and sleep disorders were independently associated with BMI, waist circumference, and fat mass. Compared to their respective reference group (8 hr, never snored, and no sleep disorder), <6 hr sleep, snoring 5+ day/week, and sleep disorder were associated with 1.04, 4.28 and 3.18 units higher BMI, 2.28 cm, 9.36 cm and 7.91 cm larger waist circumference, and 1.85 kg, 7.17 kg, and 5.15 kg more total body fat, respectively (all p<.05). Conclusions: Short sleep, snoring and sleep disorders were independently associated with higher adiposity.

T-630-P
Do Exercise Interventions Reduce BMI in Overweight and Obese Youth?
Joanna Skinner, Mindy Millard-Stafford, Michael L. Jones Atlanta, GA

Background: Commonly used in population studies, BMI is also a measure of weight status in individuals, including children. Using systematic review
and meta-analysis, we evaluated the effect of exercise interventions on BMI in overweight/obese youth. **Methods:** Forty-three randomized control trials assessing fitness were identified in PubMed, CINAHL, EMBASE, SPORT-Discus, ISI Web of Knowledge, and PsycINFO from 2000-2013. Of these, the 132 studies reporting BMI had a median age of participants of 11 yr, weekly exercise dose of 135 min, and intervention length of 13 wk. Effect sizes (ES) were calculated as the standardized mean difference. **Results:** A small, significant overall ES (ES=−0.36; 95% CI=−0.158 to −0.561) was observed for BMI reduction in exercise intervention versus control groups, but heterogeneity was moderate (I²=47%) among studies. Mode of exercise intervention did not influence the BMI ES, although strength training tended to have a lower ES (ES=−0.021; n=5 studies) compared to a combination of strength and aerobic training (ES=−0.53; n=6 studies), aerobic training alone (ES=−0.37; n=20 studies), or other training (e.g., games) (ES=−0.48; n=4 studies). Subgroup analysis indicated no difference in BMI ES for exercise vs. control (ES=−0.38; n=24 studies) compared to dietary treatment vs. exercise vs. control (ES=−0.29; n=10 studies). Meta-regression indicated significant association between BMI ES and weekly exercise dose (min/wk), but not intervention length (total weeks) (p<0.001 and p=0.27, respectively).

**Conclusions:** Exercise interventions result in a small but significant reduction in BMI for overweight/obese youth. This effect is similar across a range of exercise treatments and modes. However, physical activity interventions approaching federal guidelines of 60 min/day result in greater impact on BMI.

**T-631-P**

Morningness-Eveningness Chronotype and Exercise Response in the Training Interventions of Genotypes of Exercise Response (TIGER) Study

Danielle N. Hessong, Matthew P. Harring, Molly S. Bray Birmingham, AL

**Background:** Self-reported optimal performance varies throughout the day across individuals and may impact response to behavioral interventions for weight loss. This study examined the relationship between morningness/eveningness (ME) and objectively measured components of exercise performance and response. **Methods:** Participants (M=276; F=382, 18-35y) completed 15 wks of aerobic exercise training in the TIGER study. Exercise heart rate (HR), duration (DUR, min), intensity (INT, %HR reserve), and time of day (TIME, hr:min) were recorded using computerized HR monitors. Total exercise dose was calculated by adjusting duration by intensity and summing over all sessions to formulate a heart rate physical activity score (HRPAS). ME was assessed using the Horne-Ostberg Morningness-Eveningness scale. Analyses were adjusted for age and gender. **Results:** ME was not significantly associated with baseline physiologic measures or exercise parameters; however ME was significantly associated with HRPAS (p<0.05). Morning Types had a higher HRPAS (774.6±234.6) compared to Evening Types (738.3±253.1). TIME was significantly associated with both exercise HR (p<0.03) and INT (p<0.005) with morning times (before 9:30 a.m) associated with a higher average HR (159.8±7.5) and INT (0.694±0.061) compared to later times (after 12 pm, HR:157.9±7.1, INT:0.672±0.065). Concordance between ME type and TIME was significantly associated with both HRPAS (p<0.02) and change in waist/hip ratio (p<0.03). ME-TIME concordance was not associated with any other measure of exercise response. **Conclusions:** These results suggest that both the timing of exercise and chronotype may influence exercise tolerance and response. Further study is needed to examine whether time of day preferences help explain health outcomes (e.g., lipids and weight loss) in exercise trials.

**T-632-P**

Is Improvement in Physical Fitness Associated with Reductions in Risk Factors in Overweight and Obese Youth?

Mindy Millard-Stafford, Jeffrey S. Becasen, Allison J. Nihiser, Sarah M. Lee, Janet Fulton, Virginia M. Frederick, Atlantic, GA

**Background:** Little is known regarding the association between changes in physical fitness and health risk factors in youth, particularly for overweight or obese youth. The purpose of this study was to systematically review the literature to examine the association between changes in health-related fitness and chronic disease risk factors in overweight and/or obese youth. **Methods:** Studies published from 2000-2010 were included based on the following: randomized control trials evaluating an exercise intervention for overweight/obese youth; fitness test measures (e.g., aerobic capacity, muscular strength/endurance); measures of chronic disease risk factors related to adiposity, cardiovascular, musculoskeletal, metabolic, and mental/emotional health. Mean change scores were extracted for measures of fitness and health and categorized by significant positive, negative or null effects (p<0.05).

**Results:** The search identified 33 studies meeting the criteria. Aerobic capacity improved significantly (p<0.05) in 91% of 35 measures ranging from laboratory-based maximal oxygen uptake to field run/walk tests. Muscular strength and/or endurance improved in 82% of 17 measures. For studies reporting improved fitness, a total of 237 measures of chronic disease risk were reported. Of these, measures of adiposity (73), cardiovascular (85), musculoskeletal (15), metabolic (61), and mental/emotional health (3) improved in 60%, 32%, 53%, 41%, and 33% of cases, respectively. **Conclusions:** Overweight and obese youth can improve fitness using a variety of test measures. When aerobic or muscular fitness improves, beneficial health effects are observed in some, but not all chronic disease risk factors.
d/wk, computer use, or in consumption of breakfast, meals prepared away from home, or fast food meals. **Conclusions:** Contrary to the hypothesis, children’s health behaviors were more favorable during summer, including more PA and sleep, and there were no dietary differences. Discretionary time during summer may increase time spent in all leisure activities. Future research should investigate how these activities relate to pediatric weight gain during summer.

**T-635-P**

**Seasonal Variations in Physical Activity and Changes in Adolescent BMI**

Melanie Konrads, Jorge Chavarro, Matthew W. Gillman, Catherine Berkey, Alison E. Field Boston, MA

**Background:** Results are mixed on the association between physical activity and weight gain among adolescents. Some studies have found seasonal differences in BMI gain. No previous studies have examined seasonal variability in meeting Department of Health and Human Services activity guidelines and weight gain. **Methods:** Annually during 1997-2003, 5324 boys and 7067 girls from the Growing Up Today Study completed surveys with 17 (female) and 18 (male) questions on specific activities. We modeled activity as hrs/wk in individual activities, as well as hrs/wk of moderate to vigorous activity in each season. The outcome was becoming overweight or obesity over a 6-year period. Generalized estimating equations were used to estimate the association of activity with risk of becoming overweight or obese. Analyses were sex-specific, and controlled for age, race, baseline BMI, and sexual development. **Results:** In 1997, mean age was 12.5 years; 18% of girls and 21% of boys were overweight or obese, which increased to 21% and 30% by 2003. Youth who didn’t meet recommendations of engaging in >1 hour/day after the past year were 2.3-3.5 more likely (Girls: OR 1.02, 95% CI 1.01-1.03; Boys: OR 1.03, 95% CI 1.02-1.04) to become overweight or obese during 6 years of follow-up. Similar associations were seen among youth who were active >1 hour/day in 1-2 vs. 3-4 seasons (Girls: OR 1.02; Boys: OR 1.01). Compared to those who were active for 3-4 seasons, youth who did not engage in >1 hour/day in any season were 3% more likely to become overweight or obese (Girls: OR 1.03, 95% CI 1.02-1.04; Boys: OR 1.03, 95% CI 1.02-1.05). **Conclusions:** Youths engaging in <1 hr/day of activity were only slightly more likely to become overweight or obese than their more active peers. Current activity guidelines may be insufficient for preventing excessive weight gain.

**T-636-P**

**What Black Mothers and Daughters Say About Being Physically Active**

Wanda M. Thompson Camden, NJ

**Background:** Black adolescent girls are less physically active than any other U.S. racial/ethnic group. Obesity and obesity-related health conditions, such as type-2-diabetes, are directly related to the higher prevalence of physical inactivity. Qualifying what Black adolescent girls and their mothers think about physical activity (PA) may hold the key to improving physical activity among this group. **Methods:** This study explored factors related to lower PA among 13 Black adolescent girls (mean age 1.9 ± 1.2 years) and their mothers (mean age 48.4 ± 6.0 years). Focus groups were conducted using semi-structured questions to explore Black mothers’ and their adolescent daughters’ perspectives regarding physical activity. Mothers and daughters were interviewed separately with all sessions digitally recorded and transcribed verbatim. Atlas.ti was used to facilitate the coding and analysis of the transcribed data into meaningful themes. **Results:** Themes that emerge from the data included concerns about health, lack of knowledge, issues with time, and the importance of keeping it fun. These four themes were consistently noted among both groups. **Conclusions:** The themes that emerged from this study provide information that can be used in the development and implementation of future interventions. Both mothers and their daughters’ seemed to recognize the need and importance of regular physical activity, but need help on how to best integrate regular physical activity into their daily lives. Time management was an important concern and barrier to both groups, thereby, warranting the need to include time management sessions within future interventions.

**T-637-P**

**Race Modifies the Relationship between Physical Activity and Age in Preschool-Aged Children**

Dianne S. Ward, Derek Hales, Stephanie Mazzacana, Ambar E. Vaugh Chapel Hill, NC

**Background:** While it is well recognized that African American children suffer disproportionately higher rates of obesity, less is known about racial differences in weight-related behaviors like physical activity, particularly in young children. This study examined differences in objectively measured, moderate and vigorous physical activity (MVPA) between African American (AA) and white (W) children aged 2-5 years. **Methods:** Children (n=262) wore Actigraph accelerometers for 7 days as part of baseline data collection for a larger intervention trial. Parent and child height and weight were measured, and parents completed questionnaires. SAS 9.3 was used to fit General Linear Models (PROC GLM) to test the relationship between MVPA and race, including covariates and interactions. A final model was developed by systematically removing covariates and interaction terms with p>0.2. **Results:** MVPA was higher for AA children compared to W children, 66.6 vs. 54.3 minutes per day (p<0.0001). In the final model, the main effect for race was significant (p=0.03), as was the interaction between race and child age (p=0.0001). Compared to W children, AA children accumulated an additional 1.2 minutes of MVPA at age 2, 12.5 minutes (25% higher) at age 3, 22.9 minutes (39% higher) at age 4, and 1.6 minutes (2.5% higher) at age 5. The final model, which also included month PA data were collected, index parent age, parent BMI group, family income, child sex, BMI percentile and age, explained 43% of the variance in MVPA. Race and age already explained 23% of the MVPA variance. **Conclusions:** Physical activity levels of African American children are generally higher than white children, but reasons for this difference are unclear. Additional research is needed to determine if MVPA differences persist over time and how they may contribute to future health and weight.

**T-637-P**

**Physical Activity, Dietary Intake and BMI among Teenagers in a Mexican City: A Prospective Study**

Ana Lilia Armendariz-Anguiano, Montserrat Bacardi-Gascon, Arturo Jimenez-Cruz Tijuana, Mexico

**Background:** Obesity/overweight is a serious pediatric health condition among teenagers in a Mexican City. **Methods:** A six months prospective study was conducted in a cohort of 563 children from 7th to 8th grade, 12-15 year old students, in 20 randomly selected groups from 15 public middle schools. Weight, height, and waist circumference were assessed from students of all groups. BMI was calculated. BMI and height t-scores for age and sex were classified according to WHO criteria (2006). Food intake was assessed with a 24 h recall. PA and sedentary behavior were assessed with the YRBSS validated questionnaire. **Results:** Mean age was 13.1±0.7 years (52.8% were female). The initial frequency of overweight (OW) and obesity was 43.8%, which decreased to 41.2% six months later. At the end of the study, OW and Obese children had fewer portions of grains (p<0.0001), vegetables (p=0.03), meat (p=0.003) and savory snacks (p<0.005). At six months, boys who had <9 portions of grains per day (OR=2.6, 95% CI 1.08-3.93, p=0.03), girls that consumed <6 portions of fruits and vegetables (p<0.001), girls that consumed <6 portions of grains per day (OR=2.33, 95% CI 1.43-3.79, p<0.001), and girls with <2 dwk. of physical education classes (OR=2.12, 95% CI 1.27-3.60, p<0.004), were more likely to be OW/Obese. **Conclusions:** Fewer physical education classes and consuming fewer portions of grains/day increased the risk of having OW and Obesity among these Mexican teenagers.

**T-639-P**

**Play to Win — Role of Active Video Games in Improving Health-Related Outcomes in Young Adults**

Yijing Li, Audrey A. Opoku-Acheampong, Noel Rizzuti, Patrick Saunders, Nancy Muturi Manhattan, KS

**Background:** Although physical activity is an essential factor in disease prevention and health promotion, nearly 70% of adults and more than 30% of children and adolescents aged 6-19 years are considered overweight or obese.
College students are at great risk due to a lifestyle change as they transition into adulthood. Active video games (AVGs) require a moderate level of physical activity and full body movement and when played on a regular basis, can contribute to the player’s daily physical activity. **Methods:** This study was a survey of 151 obese adolescent students aged 13-24 years of age in a Midwestern University (N=98). Based on the Social Cognitive Theory, the study identified primary factors for sedentary lifestyles; student’s level of awareness and perceived self-efficacy of physical activity participation. **Results:** Nearly 80% of students are willing to use AVGs to increase daily physical activity but they are limited by the cost and the ability to readily access them. Students who are willing to try AVGs (42.2%) also showed interest in participating in AVG-related group fitness class. There is a significant relationship between playing AVGs and general physical activity. Additionally those who play AVGs are more likely to keep playing if they gain positive reinforcement. **Conclusions:** Students are aware of the health benefits of physical activity but are physically inactive due to low self-efficacy. Although the cost of AVGs is a barrier to students, majority of them will play if they have access. Group physical activities that incorporate AVGs will motivate greater participation among college students.

**T-640-P**

**Low Levels of Vitamin D in Obese and Normal Weight Children vs. Metabolic Risks**
Clairce Martins, Luisa Aires, Gustavo Silva, Luis Lemos, Henrique F. Nascimento, Jorge Mota Porto, Portugal

**Background:** Vitamin D (VIT-D) deficiency has been shown associated with metabolic risk factors in obese children and adolescents. Thus, the aim of this study was to evaluate the relationship between VIT-D and cardiovascular risk factors in obese and non-obese children and adolescents with low levels of VIT-D. **Methods:** 59 obese and 38 non-obese youngsters with low levels of VIT-D, 7-15 year-olds, were evaluated. Measurements included anthropometric variables (waist circumference- WC and BMI), metabolic measurements by venipuncture (plasma lipids, glucose, insulin, VIT-D and alanineaminotransferase - ALT), abdominal fat by dual-energy X-ray absorbiometry. Homeostatic model assessment - HOMA was calculated. Relationships between VIT-D and metabolic risks were examined using binary and partial correlations. Analyses were performed with SPSS 20.0 for Macintosh (p<0.05). **Results:** In obese subjects, significant negative correlations were observed between VIT-D and WC, ALT, insulin, glucose and HOMA. For the non-obese sample, significant results were observed between VIT-D and WC, ALT and insulin. When adjusted for abdominal fat, no significant result was observed. **Conclusions:** VIT-D is related to several metabolic risk factors in obese and non-obese children and adolescents. When adjusted for abdominal fat, these relationships disappeared. Further studies are needed to clarify the role of abdominal fat in the relationship between VIT-D and metabolic risks in non-obese children with low VIT-D.

**T-641-P**

**Obese Minority Youth May Need More Than 60 Minutes of Physical Activity Per Day**
Artushi P Mahajan, Kathryn Brogan, Angela J. Jacques-Tiura, Sylvie Naar-King, Deborah Ellis, Kai-Lin, Catherine Jen Detroit, MI

**Background:** Obesity is highly prevalent in minority youth. Physical activity (PA) in obese African American (AA) adolescents is an understudied, yet potentially efficacious, strategy for treatment. Therefore, our aim was to describe the type and intensity of PA by recall in obese AA adolescents.

**Methods:** A sample of 151 obese AA adolescents (BMI 37.7±7.13, age 13.7±1.34 yrs, 70% female) completed the 3 day Physical Activity Recall (Pate, 2003) before starting a 6 month behavioral weight loss trial. Participation in a sport, cardio, or strength activity was reported by 60% of the youth. The most common activities were endorsed by 76% with a mean of 1.12±0.59 hrs/d. Significant activity participation was observed between obese and non-obese youth (0.29 hrs/d), P.E. class (0.12 hrs/d), and eating a meal (0.74 hrs/d). Participation in school, sports, and car-following were observed by 42% of the youth. Students are aware of the health benefits of physical activity but are physically inactive due to low self-efficacy. Although the cost of AVGS is a barrier to students, majority of them will play if they have access. Group physical activities that incorporate AVGs will motivate greater participation among college students.

**T-642-P**

**The Effect of Obesity on Chest Radiography, from the Database of Preoperative Autologous Blood Donation (PABD)**
Naohito Saito Yokohama, Japan; Kimie Kumagai, Daisuke Horiguchi, Kazuyoshi Watanabe Koshigaya, Japan; Osamu Toyoshima Yokohama, Japan; Cheiko Matsumoto, Satoru Ozeki Koshigaya, Japan

**Background:** The severities and the population of Obesity and its complications are increasing, but its effect on respiratory system is not considered enough. We established database of PABD (DBPABD), in which we analyzed the effect of BMI on lung size. **Methods:** We defined Transverse Cardiac Distance (TCD), Transverse Radius of the Thorax (TRT), Longitudinal Pulmonary Distance (LDP) and Sagittal Pulmonary Distance (SPD). We statistically analyzed the measurements with using previously studied Cardiothoracic Ratio (CTR) and obesity definition (BMI ≥ 25) among Asians in Japan. **Results:** Asians of 359 people (202 female, 157 male) in Japan engaged in PABD from 1st June 2010 to 30th May 2012. BMI of female population increased till age of 80 years old, while BMI of male population increased till age of 60 years old. Some of the people (40 or more years old, n = 295, female 154, male 141) were classified into 250 (BMI≥25) or 251 (25≤BMI). Both in female and male, the elongation of CTD, the elongation of TRT, the shortening of left LPD and the shortening of right LPD were statistically significant, while the increase of CTR was significant only among female population. SPD of 251 was longer compared to SPD of 250 both among female (n = 137) and male (n = 88) population, which was statistically significant. FEV1% increased among male obese population, when we stratified BMI every 2 kg/m2 and FEV1% every 5% without excepting for the population of respiratory diseases. **Conclusions:** To our knowledge, this is the first report on measurements of the lung and the thorax among obese people. FEV1% might not decrease among obese people of DBPABD contrary to studies from other groups.

**T-643-P**

**A Genome-Wide Association Study Identifies SLC2A9 As a Strong Determinant of Serum Uric Acid Levels in Hispanic Children**
V. Saroja Voruganti, Sandra Laston, Karin Haack San Antonio, TX; Nitesh Mehta Houston, TX; Shelley A. Cole San Antonio, TX; Nancy F. Butte Houston, TX; Anthony G. Comuzzie San Antonio, TX

**Background:** Elevated levels of serum uric acid (SUA) are associated with increased risk for gout, cardiovascular and renal diseases. Studies in adults have consistently shown association of solute carrier family 2, member 9 (SLC2A9) single nucleotide polymorphisms (SNPs) with variation in SUA. However, it is not known whether this association of SUA with increased disease risk and/or SLC2A9 SNPs extends to children. Thus, our aim was to investigate whether variation in SUA is under genetic influence and whether the association with SLC2A9 SNPs generalizes to Hispanic children of the Viva La Familia Study. **Methods:** We conducted a genome-wide association study with 1.1 million SNPs using the Illumina Infinium technology in 815 children. **Results:** We found SUA to be significantly heritable (h2 = 0.45 (0.08), p = 5.8 x 10-11) and a significant association (p < 10-09) of SLC2A9 SNPs with variation in SUA. Several of the significantly associated SNPs (rs6449213,rs10805346,rs1014290 and rs737267) were previously associated with SUA in adults of various populations. We also found positive genetic effects of SLC2A9 SNPs with variation in SUA. **Conclusions:** The results show that variation in SUA in children is under significant genetic influence and is associated with obesity-related phenotypes.

**OBESITY 2013 ABSTRACT BOOK**

**POSTER ABSTRACTS — WEDNESDAY, NOVEMBER 13 to FRIDAY, NOVEMBER 15, 2013**

**Thursday, November 14, 2013**
Posters on Display: 10:00 AM – 3:30 PM and 5:30 PM – 7:00 PM
Location: Exhibit Hall A

**Genetic Epidemiology**

**T-642-P**

**The Effect of Obesity on Chest Radiography, from the Database of Preoperative Autologous Blood Donation (PABD)**

**T-643-P**

**A Genome-Wide Association Study Identifies SLC2A9 As a Strong Determinant of Serum Uric Acid Levels in Hispanic Children**

For more information on this topic, please visit [www.obesityweek.com](http://www.obesityweek.com)
In addition, GWAS results of SUA in adults extend to children suggesting its additional importance as a pediatric biomarker of disease risk.

T-644-POT
Pediatric Insulin and Glucose Concentrations Respond to the Interaction Trans Fat and Carbohydrate Consumption with Amerindian Genetic Background
Michelle M. Bohan Brown, Jose R. Fernandez Birmingham, AL

Background: Research has suggested that culturally-influenced diets consumed by culturally-defined populations may result in healthier metabolic outcomes, suggesting that the effect of food consumption and disease risk factors can be mediated by individual’s ancestral genetic predisposition. Therefore, we explore if variability in insulin-related outcomes in children could respond to the interactive effect of dietary intake and genetic ancestry.

Methods: Measures of insulin sensitivity index (SI), acute insulin response to glucose (AIR), fasting insulin and fasting glucose were obtained from 262 multiethnic children through an intravenous glucose tolerance test. Measures of total carbohydrate, added sugar, and total, saturated (SFA), monounsaturated (MUFA), polyunsaturated (PUFA) and trans (TFA) fats were obtained from two 24-hour dietary recalls. Regression models evaluated the independent and interactive effects of dietary measures and Amerindian genetic admixture (ADM) on insulin-related outcomes, after adjusting for standard covariates.

Results: The interaction of ADM and total carbohydrate was significantly associated with fasting insulin (p=0.0124). Fasting glucose was associated with the interaction of ADM and TFA intake (p=0.0372). There was no association of AIR or SI with the interaction of ADM and any of the dietary intake variables. The interaction models explained more of the variance than the model with ADM alone (1.86% for fasting glucose and 2.19% for fasting insulin).

Conclusions: Our study indicates that fasting insulin and glucose in children may be dependent on how ancestral background interacts with dietary consumption. This finding may be useful in developing strategies for the prevention of diabetes using culturally relevant diets.

T-645-P
Obesity Exacerbates Genetic Predisposition for Hypertriglyceridemia
Christopher Cole, Majid Nikpay, Mary-Ellen Harper, Robert Dent, Ruth McPherson Ottawa, Canada

Background: The Global Lipids Genetics Consortium® identified 95 common loci that explained 12.2% (LDL-C), 12.1% (HDL-C) and 9.6% (triglycerides [TG]) of total variance in plasma lipid traits in the Framingham Heart Study. Since adiposity is associated with plasma levels of TG and HDL-C, we hypothesized that the predictive value of common risk variants for these lipid traits would differ for obese versus lean subjects.

Methods: The study population consisted of two independent cohorts of subjects of European descent, genotyped on the Affymetrix 6.0 array with 1000G imputation. 1) OBLE: 959 obese/869 lean. 2) CC (healthy elderly subjects recruited as controls for a CAD study) 830 obese/1,044 lean. A genetic predisposition score was calculated for each individual as a sum across SNPs of the number of risk alleles at each SNP multiplied by the effect size of the SNP. Results: In the OBLE cohort, a genetic risk score explained a greater percentage of the total TG variance in obese vs lean (beta GRS=0.154 mmol/L (p=2e-16) vs 0.094 mmol/L (p=5.8e-10; adjusted R2=0.090 vs 0.042), a finding that was replicated in the CC cohort for obese vs lean (beta GRS=0.153 mmol/L (p=1.5e-7) vs 0.102 mmol/L (p=4.2e-6; adjusted R2=0.044 vs 0.024). A similar but less significant trend was noted for LDL-C. In addition, the genetic risk score predicted variability in TG better than sex/age for obese subjects. In contrast a genetic risk score for HDL-C was a better predictor of this trait in lean versus obese subjects in both the OBLE and CC cohorts. Genetic risk scores for each lipid trait showed no association with BMI (P>0.2) indicating that the above findings are not due to possible overlap between genetic loci influencing BMI and lipid traits.

Conclusions: Genetic predisposition to elevated plasma triglycerides and LDL-C and low HDL-C is highly sensitive to extremes of BMI.

T-646-P
DNA Methylation Patterns in Blood from Successful Weight Loss Maintainers Resemble Normal Weight Individuals and Differ from Obese Individuals
Jeanne M. McCaffery, Yen-Tuong Huang, Nicola Hawley, Rena R. Wing, Karl T. Kelsey Providence, RI

Background: A role for DNA methylation in obesity has been established in animal models. Emerging research further indicates that change in weight through intentional weight loss in obese adults may change methylation of specific genes in adipose tissue and peripheral blood mononuclear cells (PBMCs).

Methods: We examined DNA methylation patterns in PBMCs of 16 normal weight participants (NW; mean BMI=21.9, SD=1.8), 16 obese participants (mean BMI=34.6, SD=3.7) and 16 successful weight loss maintainers who lost sufficient weight to go from obesity to normal weight and maintained the weight loss for at least three years (SWLM; mean maximum BMI=33.0, SD=3.1, mean current BMI=23.8, SD=1.6). We used autosomal loci from the Illumina 450K methylation chip and corrected for age, gender, and the normal cell lineages of the PBMCs.

Results: Two peaks emerged in three-group, chip-wide analyses, including PVRL1 (cg52254946; p=1.5x10^-16), which plays a critical role in calcium efflux from skeletal muscle during muscle contraction, and TUBA3C (cg22274414; p=4.78e-06), previously associated with insulin levels. In post-hoc analyses, both NW and SWLM differed significantly from currently obese individuals (RYR1 cg05254946: NW-obese, p=1.32e-04; SWLM-obese, p=8.76e-06; TUBA3C cg22274414: NW-obese, p=3.30e-05; SWLM-obese, p=1.79e-05) but did not differ from each other (RYR1 cg05254946: NW-SWLM, p=0.11; TUBA3C cg22274414: NW-SWLM, p=0.30).

Conclusions: These data indicate that SWLM had peripheral blood DNA methylation profiles that resembled normal weight individuals but differed from obese individuals at two loci. Further studies are needed to understand the mechanisms through which obesity is associated with DNA methylation and the role of successful weight loss in altering these associations.

T-647-P
This abstract has been withdrawn.
How Sweet It Is? Taste Genetics Influence Children’s Intake of Sweet vs. Savory Foods at an Ad Libitum Buffet

Kathleen L. Kellner University Park, PA; Annemarie Olsen Copenhagen, Denmark; Ida Karin Madsen, Christopher van Belle New York, NY; Rachel Bloom, Terri L. Cravener University Park, PA

Background: Inherited sensitivity to the bitter taste of 6-n-propylthiouracil (PROP) has been associated with dietary selection. We previously used questionnaires to show that children who are PROP tasters reported greater intake of sweets and lower intake of meats (savory fats) relative to non-taster children. Laboratory studies are needed to confirm these findings. Methods: 75 children (mean ± SD age = 5.04 ± 0.77 y. and BMI z-score = 1.0 ± 1.02 kg/m2) from diverse ethnicities attended 4 laboratory sessions, the last of which included a highly palatable buffet consisting of savory-fats (e.g. pizza), sweet-fats (e.g. cookies, cakes), and sweets (e.g. juices, candies). Children were classified as tasters (n=53) or nontasters (n=22) using standard screening procedures. Height and weight were measured on the first visit. Data were analyzed by ANOVA with intake from savory fats, sweet-fats, and sweets as dependent variables and PROP status as the independent variable. Results: Taster children consumed more calories from sweet foods than nontasters, 191.2 ± 111.0 kcal (tasters) vs. 137.6 ± 91.8 kcal (nontasters). Nontaster children consumed 50 kcal more from savory-fats than taster children, but BMI z-score strongly influenced this model (p<0.001) and the effect of PROP status was not significant. Intake of sweet-fats did not differ by weight or PROP status. Conclusions: At a highly palatable meal, PROP taster children preferentially consumed more sweets than nontaster children, while heavier children consumed more savory fats. These findings may have implications for understanding differences in susceptibility to hyperphagia in children.

T-650-P

The Methylation of the LEPR/LEPROT Genotype at the Promoter and Body Regions Influence Concentrations of Leptin and BMI in Girls at Age 18 Years If Their Mother Smoked During Pregnancy

Wilfried Karmarsz Memphis, TN; Mitra Youssif Columbia, SC; Hongmei Zhang Memphis, TN; Susan Ewart East Lansing, MI; Hasan S. Arshad Newport, Isle of Wight, United Kingdom; John W. Holloway Southampton, United Kingdom

Background: Leptin binds to the leptin receptor encoded by the LEPR/LEPROT genotype. To determine whether DNA methylation (DNA-M) of the leptin receptor genotype (LEPR/LEPROT) links gestational smoking and leptin serum levels and BMI later in life, we focused on female offspring, 18 years of age, from the Isle of Wight Birth Cohort (IOWBC). Methods: Using general linear models, we tested a two-stage model. First, we investigated whether single nucleotide polymorphisms (SNPs) acting as methylation quantitative trait loci (methylQTLs) depending on gestational smoking were related to differentially methylated cytosine-phosphate-guanine (CpG) sites. In stage 2, we tested whether the selected CpG sites, in interaction with other SNPs (modifiable genetic variants, modiGVs), were associated with serum leptin and BMI (age 2). Children from the IOWBC were followed from birth to age 18. Information on gestational smoking was gathered upon delivery. SNPs tagging LEPR and LEPROT genes were genotyped. Data on LEPR/LEPROT DNA-M and leptin were obtained from blood samples drawn at age 18; to determine BMI, height and weight were ascertained. Blood samples were provided by 238 girls. Results: Of the 21 CpG sites tested, interactions between gestational smoking and SNPs were detected for 16 CpG sites. Methylation of seven of the 16 CpGs were, in interaction with modiGVs, associated with leptin levels at age 18 years. Two CpG sites survived a multiple testing penalty, were associated with leptin and with BMI. Conclusions: This two-stage model may explain why maternal smoking has a long-term effect on leptin levels and BMI in girls at age 18 years.
interacting effects of genetic risk factors previously studied in populations of fluence obesity and related outcomes. This study aims to test the direct and African Americans experience among the highest rates of obe-

Background:

N. Trumpeter, Adrienne Lewandowski

African American adults living in underserved communities (poverty rates of 23-39%). Buccal swabs were collected for genotyping single nucleotide poly-
morphisms (SNPs). Blood pressure, anthropometric, accelerometer-estimated physical activity, psychosocial, and environmental (e.g. community-level so-
cioeconomic status, neighborhood satisfaction) data were obtained using standard protocols. Preliminary genotyping was done using samples from 40 participants with varied phenotypes based on waist circumference and body mass index (BMI) distributions; analyses within the larger sample are ongo-
ing. Results: The sample is predominantly female (65%) and preliminary findings showed that a BDNF SNP (rs2200674) was associated with larger waist circumference (BDNF, r=36, p<0.05) and a trend toward larger com-
position, BMI-waist circumference (BDNF, r=30, p=0.10). An FTO SNP (rs1121980) was not associated with outcomes in this small subsample. Conclusions: Findings support a role of genetic risk in cardiometabolic out-
comes for African American adults, and the effects demonstrated in this small sample suggest that the relation of BDNF may be robust. Future investigation of gene-environment interactions within the larger sample may inform a more comprehensive understanding of obesity in African American adults in high-risk environments.

T-655-POT

Associations of Genetic and Environmental Risk Factors with Obesity and Cardiometabolic Outcomes in Underserved African-

American Adults

Sandra M. Coulson, Dawn K. Wilson, Stephen Kressovich, Gregory Hand, Tyler McDaniel Columbus, SC; Matthew C. Kostek Pittsburgh, PA; Nevely N. Trumpeter, Adrienne Lewandowski Columbus, SC

Background: African Americans experience among the highest rates of obe-
sity in the U.S., and its development may be largely influenced by genetic risk. Additionally, genetic factors may interact with environmental risk to in-
fluence obesity and related outcomes. This study aims to test the direct and interacting effects of genetic risk factors previously studied in populations of European descent, on cardiometabolic outcomes in African American adults residing in high-risk environments. Methods: Data were collected in 430 African American adults living in underserved communities (poverty rates of 23-39%). Buccal swabs were collected for genotyping single nucleotide poly-
morphisms (SNPs). Blood pressure, anthropometric, accelerometer-estimated physical activity, psychosocial, and environmental (e.g. community-level so-
cioeconomic status, neighborhood satisfaction) data were obtained using standard protocols. Preliminary genotyping was done using samples from 40 participants with varied phenotypes based on waist circumference and body mass index (BMI) distributions; analyses within the larger sample are ongo-
ing. Results: The sample is predominantly female (65%) and preliminary findings showed that a BDNF SNP (rs2200674) was associated with larger waist circumference (BDNF, r=36, p<0.05) and a trend toward larger com-
position, BMI-waist circumference (BDNF, r=30, p=0.10). An FTO SNP (rs1121980) was not associated with outcomes in this small subsample. Conclusions: Findings support a role of genetic risk in cardiometabolic out-
comes for African American adults, and the effects demonstrated in this small sample suggest that the relation of BDNF may be robust. Future investigation of gene-environment interactions within the larger sample may inform a more comprehensive understanding of obesity in African American adults in high-risk environments.

T-655-P

Racial Variation in the Distribution of Demographics, Body Mass and Weight-Related Medical Co-Morbidities among the Mega-

Obese: Analysis of 1,673 BOLD Database Patients

Ezekiel F. Adewale, Gus J. Slotman Vineyard, NJ

Background: Interaction of race and medical problems in the mega-obese is unknown. This study identified racial variations of weight, BMI, and co-mor-
bidities in severely obese patients. Methods: Surgical Review Corporation’s BOLD data on 1,673 patients who were pre-op for duodenal switch was ana-
lyzed in four groups: African-American (n=131), Caucasian (n=1,380), Hispanic (n=48), and Other (Pacific Islands, Native American, or >1 race recorded, n=108). Age, weight and Body Mass Index (BMI) underwent analysis of variance. Dichotomous variables were assessed by Chi-squared.

Results: Results: African-American Caucasian Hispanic Other p value Age 41+ 10 46+11 42+11 42+11 <0.05 Weight (kg) 161+32 148+33 145+33 150+33 <0.05 BMI 57+10 52+9 53+11 52+9 <0.05 Hypertension 60.31% 63.90% 56.25% 52.78% <0.05 Sleep Apnea 63.36% 62.1% 50% 45.37% <0.01 Pulmonary Hypertension 61.1% 13.62% 14.58% 5.56% <0.001 Diabetes 35.11% 43.62% 52.08% 27.78% <0.01 Cholelithiasis 12.98% 22.75% 20.83% 21.3% <0.05 Hyperlipidemia 28.24% 46.81% 52.08% 33.33% <0.001 Depression 33.33% 44.49% 31.25% 13.89% <0.001 Unemployed 24.43% 31.45% 45.83% 17.59 0.001 Conclusions: Conclusions: In mega-obesity, severe co-morbidities are common and vary by race. African-American weight and BMI are greatest. Caucasians and African-Americans have highest hypertension and sleep apnea. Diabetes, pul-
monary hypertension, and hyperlipidemia are most frequent among Cau-
casians and Hispanics. Caucasians are oldest and have depression most often. Hispanics are unemployed at the highest rates. Clinical suspicion for these race-related clinical factors should be heightened in managing extremely obese patients. Attention to these findings may facilitate pre-surgical prepara-
tion, and could help optimize obesity outcomes.

Friday, November 15, 2013

Poster abstracts for display: 10:00 AM – 3:30 PM

Location: Exhibit Hall A

Bone

T-656-P

Physiologic Relevance of Lipid Profile on Bone Modeling in Obese Children

Anna L. Newton, Lynae J. Hanks, Krista Casazza Birmingham, AL

Background: The prevalence of fracture has increased in obese children indi-
cating an impaired metabolic milieu with excess adiposity. While investiga-
tions into explanatory mechanistic pathways have primarily focused on glucose dysregulation, physiologic lipid distribution is integral and has been relatively underappreciated. Obesity-induced perturbations in lipid homeosta-
sis represents a potential physiologic mechanism underlying impaired bone integrity in obese children. The objective of this study was to investigate the association between lipid profile and markers of bone turnover in obese early pubertal females on a six-week eucaloric diet. Methods: Participants in-
cluded white and black girls (BMI>85th; n=12) ages 8-11 years. Bone mineral content (BMC) and total fat were assessed by DXA. Measures of bone deposition (P1NP) and resorption (CTX), and lipid metabolism (Chol; HDL; LDL; TG) were assessed from a fasting blood sample. Results: In the absence of substantial weight change all measures of lipid metabolism decreased over the six-week eucaloric period with the exception of HDL, which increased. An inverse association between CTX and change in Chol, LDL, and TG was observed (r=-0.77, -0.82, -0.71; all p≤0.05, respectively), whereas change in HDL was positively associated with P1NP (r=0.76, p=0.03). Conclusions: Improvements in lipid profile were associated with markers of increased bone mineralization, suggesting that optimizing the lipid profile through diet may confer greater balance in the bone modeling process in obese children. Understanding the relationship between lipid me-
tabolism and bone homeostasis is paramount to intervention efforts to sup-
port healthy bone formation.
T-657-P
Is a Blast Off in FGF23 a Factor Underlying Fracture During Growth?
Lynae J. Hanks, Krista Casaza, Ambika P. Ashraf, Orlando M. Gutierrez
Birmingham, AL
Background: The increased fracture risk in obese children suggests excess adiposity may have an adverse effect on the growing skeleton. While obesity has been associated with increased densitometric bone measures, qualitative assessments of bone have indicated impaired bone structure. Thus identification of signaling factors and pathways which correspond with bone phenotypes early in the life course is essential. The bone-derived hormone fibroblast growth factor-23 (FGF23), integral in systemic phosphorous regulation with an inhibitory role in bone mineralization, has emerged as a potential mediator of bone quality. However, data on FGF23 in children is lacking. Methods: We investigated associations of FGF23 with body composition in children and the extent to which obesity may influence the relationship. FGF23, fat mass, and bone mineral content (BMC) and density (BMD) were assessed in 25 children ages 7-11yr (36% male). All of the females and a third of the males were obese. Results: There were no differences in age, height, BMC, BMD or FGF23 by weight status. In boys, mean FGF23 was higher in those who were obese vs. lean (p<0.02). Bivariable correlations revealed a positive association between FGF23 and height (p=0.06), weight (p=0.02), BMC (p=0.03) and total fat (p=0.03). After controlling for height and puberty stage, FGF23 was marginally correlated with total fat in females (r=0.44, p=0.11), and was inversely associated with BMD (r=-0.98, p=0.02) in lean boys. Conclusions: These data suggest that FGF23 concentrations are associated with body composition in children and that the magnitude and direction of these associations may differ by obesity status.

T-658-P
Osteogenic and Anti-Adipogenic Effects of Guggulsterone in Human Mesenchymal Stem Cells
Sujuan Rayalam Suwance, GA; Jeong Yeh Yang, MaryAnne Della-Fera, Clifton A. Baile
Athens, GA
Background: The accumulation of adipocytes in bone marrow is a major factor contributing to age-related bone loss. Mesenchymal stem cells (MSC) within bone marrow can differentiate to form either adipocytes or osteoblasts and factors that suppress adipocyte differentiation have beneficial effects on bone formation. In this study, the anti-adipogenic and osteogenic effects of guggulsterone (GS), a natural phytosterol found in the bark of Commifora mukul, was investigated in human MSC cultures. Methods: Commercially available hMSC were cultured under adipogenic or osteogenic conditions, as recommended by the supplier with slight modifications. Commercially available hMSC were cultured under adipogenic or osteogenic conditions, as recommended by the supplier with slight modifications. Results: GS increased the proliferation of hMSC by 40% at 25μM, and increased the expression of osteogenic marker genes (ALPL, COL1α1, OPN) by 2-3 fold and decreased the expression of adipogenic marker genes (PPARγ, C/EBPα, LPL) by 2-3 fold in osteogenic and adipogenic conditions, respectively. Furthermore, GS increased osteogenesis and decreased adipogenesis in hMSC differentiated to the osteogenic and adipogenic lineages, respectively. Conclusions: These results suggest that GS is a promising therapeutic agent for the treatment of osteoporosis and obesity.

T-659-P
Preliminary Analysis of Selected Interactions between Adipose Tissue and Bone Metabolism in Humans
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Background: Recent experimental studies suggest existence of a metabolic cross-talk between adipose tissue (AT) and bone metabolism (so called “bone-fat” axis). However, till today little is known about the direct composition of human AT environment in terms of key molecules influencing bone (marrow) metabolism. Methods: In this study we analyzed blood and AT samples (35 subcutaneous and 35 omental) derived from individuals undergoing elective surgery. Plasma and AT-derived interstitial fluid levels of parathyroid hormone (PTH), osteocalcin and stromal-derived factor-1 (SDF-1) were measured and compared between lean, overweight and obese individuals. Results: We found that obese patients had significantly lower plasma osteocalcin, and higher SDF-1 and PTH levels (p<0.05 for all). Importantly, AT levels of all examined substances were significantly lower than the corresponding levels in the plasma (in all cases at least p<0.05), and depot-specific differences in levels of examined parameters were observed. AT PTH and osteocalcin values were associated with SDF-1. Subcutaneous and visceral/omental concentrations of osteocalcin and PTH, were strongly associated with values of such parameters as age, body mass or adiposity indexes (BMI and BAI, respectively) and/or waist-to-hip ratio (WHR). Conclusions: In summary, our study demonstrated that obese patients have significantly different composition of AT environment in terms of levels of molecules regulating bone (marrow) metabolism, and this seemed to be associated with systemic changes in PTH, osteocalcin and SDF-1. Our study also offers further indirect translational evidence for existence of a biochemical cross-talk between bone and AT metabolism (so called “bone-fat” axis) in humans.

T-660-P
5-aza-2 Deoxycytidine Ameliorates Atherosclerosis Through Suppressing Macrophage Inflammation
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Background: Inflammation marks all stages of atherosclerosis. DNA hypermethylation in whole genome or in specific genes is associated with inflammation and cardiovascular diseases. Methods: We aim to study the role of DNA methylation in atherosclerosis. Low density lipoprotein receptor knock-out (LDLR-/-) mice were put on an atherogenic diet and administrated with either saline or the DNA methyltransferase inhibitor 5-aza-2-deoxycytidine (5-aza-dC) (0.25mg/kg) for up to 30 weeks. The development of atherosclerosis was analyzed. Results: 5-aza-dC treatment markedly decreased the formation of atherosclerotic plaques in LDLR-/- mice without changes in body weight, plasma lipid profile and macrophage cholesterol content. Instead, this effect was associated with decreased macrophage content and suppressed macrophage inflammation in atherosclerotic plaques. Specifically, 5-aza-dC treated macrophages had down-regulated expression of genes involved in inflammation (TNF-α, IL-6, and iNOS) and chemotaxis (CCL2, CCL5 and CCL9), which in turn resulted in attenuated migration and adhesion to endothelial cells. 5-aza-dC also suppressed macrophage endoplasmic reticulum (ER) stress, a key upstream signal that activates macrophage inflammation and apoptotic pathways, and reduced apoptosis in atherosclerotic plaques. Finally, 5-aza-dC demethylated liver X receptor (LXRx) and peroxisome proliferator-activated receptor γ (PPARγ) promoters, which are both enriched with CpG sites. This led to over-expression of LXRx and PPARγ, which may be responsible for 5-aza-dC’s anti-inflammatory and atheroprotective effects. Conclusions: Our findings provide strong evidence that DNA methylation plays a significant role in cardiovascular diseases and may serve as a therapeutic target for the prevention and treatment of atherosclerosis.

T-661-P
Epigenetic Regulation of Macrophage Polarization by DNA Methyltransferase 1 (DNMT1)
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Background: Obesity is associated with increased classically activated M1 adipose tissue macrophages (ATMs) and reduced alternatively activated M2 ATMs, which contributes to insulin resistance. Epigenetic mechanisms play important roles in complex diseases including obesity and insulin resistance.
T-662-P
5-aza-2 deoxycytidine Improves Insulin Sensitivity Through Promoting Macrophage Alternative Activation
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Background: Obesity is associated with deregulated adipose tissue macrophage (ATM) polarization and inflammation, which contributes to insulin resistance. Methods: In this study, we aim to investigate the role of DNA methylation in the regulation of macrophage polarization, inflammation and insulin sensitivity. 5-aza-2-deoxycytidine (5-aza-dC) was used as a DNA methylation inhibitor. Results: Macrophages treated with 5-aza-dC have significantly increased expression of alternatively activated M2 macrophage markers, including arginase 1, mannose receptor, interleukin 10 and IL-4. IL-4 receptor α and IL-1 receptor antagonist. Pretreating macrophages with 5-aza-dC for 4 days significantly inhibited lipopolysaccharide and stearic acid-induced TNFα expression and secretion. 3T3-L1 adipocytes co-cultured with 5-aza-dC-pretreated macrophages have significantly increased insulin-stimulated signaling events, insulin-stimulated glucose uptake, and reduced expression of pro-inflammatory cytokines. Treating diet-induced (DIO) or genetically obese mice with 5-aza-dC resulted in improved insulin sensitivity without changes in body weight. This was associated with increased M2 ATM content and reduced adipose tissue and ATM inflammation. Finally, peroxisome proliferator-activated receptor γ1 (PPARγ1) is an important regulator of adipose tissue metabolism, whereas PPARγ1 expression, which is associated with reduced DNA methylation at PPARγ1 promoter; whereas stearic acid and TNFα profoundly suppressed PPARγ1 expression in macrophages, which is associated with increased DNA methylation at PPARγ1 promoter. Conclusions: In summary, DNA methylation plays an important role in regulating macrophage polarization and inflammation, and may be one of the underlying mechanisms leading to deregulated ATM polarization, inflammation and insulin resistance in obesity.

T-663-P
Impact of Successful Leptin Replacement Therapy in Japan on Adult and Child, Systemic and Partial Lipodystrophy
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Background: Leptin is implicated in the regulation of appetite and energy expenditure. Lipodystrophy is a rare disorder characterized by loss of adipose tissue due to genetic and acquired causes, which presents increased appetite, metabolic abnormalities such as insulin-resistant diabetes and hypertriglyceridermia and fatty liver. In pre-clinical studies, by cross-mating experiments between our leptin-transgenic skinny mice and model mice of lipodystrophy, A-ZIP/F1 mice, we demonstrated that leptin replacement improves augmented appetite and metabolic abnormalities. Methods: We have performed clinical studies on leptin-replacement therapy for 15 patients with lipodys-
0.4 kg/m²; mean IMCL content and lipid droplet density in 28 healthy male (27 wk high fat diet overfeeding (40% extra calories; 44% fat) on the changes in subcutaneous lipid (IMCL) is less clear. We aimed to determine the effects of 8-

Background: Patterns of adipose tissue fat storage are correlated with sex-specific body fat distribution. This lipogenic pathway includes CD36 (facilitated transport), acyl-CoA synthetases (ACS; the first step in fat metabolism) & diacylglycerol acyl-transferase (DGAT; the final step of triglyceride synthesis). Our goal was to define differences in adipose CD36, ACS & DGAT in relation to upper & lower body subcutaneous (UBSQ & LBSQ) fat depots, fat cell size & sex. Methods: We analyzed subjects’ UBSQ & LBSQ fat biopsy samples collected in the postabsorptive state. Fat cell size (microscopy), as well CD36 protein content (ELISA) and ACS & DGAT enzyme activity (expressed per 1000 cells) were composition (DXA & CT). Data are presented as medians; 25th-75th quartiles.

Results: Healthy, premenopausal females (n=78) & males (n=60) did not differ by age (37.28±26 yr); BMI (28.4±4.26.3±2.1 kg/m²), UBSQ (0.60±0.45.83 μg/cell) or LBSQ fat cell size (0.76±0.60.94 μg/cell). CD36, ACS & DGAT increased as a function of fat cell size in both depots & sexes (p<0.007), except for UBSQ ACS in males. All three lipogenic factors were greater in LBSQ than UBSQ fat (p<0.05). LBSQ fat ACS & DGAT were greater in females than males (ACS: 59 vs 9 pmol/1000 cells/min; DGAT: 4.3 vs 3.1 pmol/1000 cells/min; p<0.0003); there were no differences in UBSQ fat lipogenic factors between sexes. There were no sex differences in UBSQ or LBSQ fat CD36.

Conclusions: CD36, ACS & DGAT increase as a function of fat cell size in SQ fat, but the increases in ACS & DGAT are generally greater in females than males, which may explain greater fat storage in females. ACS & DGAT are greater per 1000 cells in LBSQ than UBSQ in both sexes. The absence of a sex difference in CD36 suggests facilitated transport may not be a rate limiting difference in fat storage between the sexes.

T-667-P
Decrease in Smaller Lipid Droplet Density Is Protective Against Overfeeding-Induced Increase in Fat Cell Size and Weight Gain
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Background: Overfeeding is associated with increased fat cell size (FCS) and body weight (BW). Whether overfeeding causes an increase in intramyocellular lipid (IMCL) is less clear. We aimed to determine the effects of 8-wk high fat diet overfeeding (40% extra calories; 44% fat) on the changes in IMCL content and lipid droplet density in 28 healthy males (27±1.7 years; BMI 25.0±0.4 kg/m²) compared to 11 non-overfed controls. Methods: FCS was assessed by osmium fixed cryosections from subcutaneous abdominal biopsies on a Multisizer Coulter analyzer. Lipid droplet size and density were assessed from stained images using ImageJ software in a size scale of 1-40 pixels (n=13).

Results: Overfeeding resulted in an average 7.5±6.04 kg increase in BW and ~39% increase in FCS without a change in IMCL (357±2.241.1 to 367±2.230.2 AU; p<0.09). The density of smaller lipid droplets decreased in muscle fibers (~16% and ~20% for 1-2 and 3-5 pixel size lipid droplets; p<0.05) after overfeeding. The density of smaller lipid droplets located at the periphery of the muscle fibers decreased significantly ~17% and ~20% for 1-2 and 3-5 pixel size lipid droplets; p<0.05), while there was no significant change in centrally located lipid droplet density. The decreased density of smaller lipid droplets was negatively associated with the overfeeding induced increase in BW (R2=0.27 for 1-2 pixel lipid droplets; p<0.05) and FCS (R2=0.27 for 1-2 pixel lipid droplets; p<0.05). Conclusions: High fat diet overfeeding does not change overall IMCL content. However, it reduces the density of smaller lipid droplets located at the peripheral region of the muscle fibers. This restructing of lipid droplet sizes in muscle fibers may represent a protective mechanism counteracting the deleterious effects of fat cell hypertrophy and weight gain.

T-668-P
Adipocyte-Derived Exosomal miRNAs Associated with Body Mass Index in Adolescents
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Background: Though the connection between adiposity and the development of cardiometabolic disease is well established, direct mechanisms driving this effect are unclear. Adipose tissue releases exosomes containing miRNAs that can travel to and affect target organs. The aim of this study was to isolate and characterize obesity effects on adipocyte-derived exosomal miRNAs, specifically testing for relationships to body mass index (BMI) in lean and obese adolescents. Methods: Adipose exosomes were isolated from visceral (VBSQ) and subcutaneous (UBSQ) fat depots from lean (L; N=5; BMI 23.2±1.3 kg/m²) and obese (Ob; N=7; BMI 41.2±6.5 kg/m²) females. Paired visceral and subcutaneous adipose samples were collected for each subject. Exosomal miRNA were isolated and analyzed via microarray analysis (Affymetrix Genechip miRNA 3.0 arrays). Results: Adipose-derived exosomes containing miRNAs associated with BMI were isolated and analyzed. miR-548o was upregulated and miR-96-star was downregulated in BMI (p<0.01). Prioritizing miRNAs with the highest mean expression, the top results positively correlated with BMI were miR-548o (r=0.58; p=0.003) and miR-96-star (r=0.53; p=0.008). The top results negatively correlated with BMI were miR-629 (r=0.53; p=0.007) and miR-4423-3p (r=0.51; p=0.009). Pathway analysis revealed: multiple genes associated with coronary artery disease are predicted targets of both miR-548o (N=13) and miR-96-star (N=33), while 16 targets for miR-629 are associated with abnormal epithelial cell function. miR-4423-3p was most ubiquitously expressing adipocyte- derived exosomes; pathway analysis suggests a key role in kidney dysfunction (33 genes involved in kidney cell death and 9 genes involved in glomerular cell proliferation). Results: Cell viability results demonstrated no significant difference (P > 0.05) between non-differentiated cells, control and quercetin or isorhamnetin treated cells. During adipocyte differentiation in the presence of quercetin or isorhamnetin, cell viability was above 94.84% and 97.63%, respectively. Red oil O staining showed that quercetin or isorhamnetin were more effective than quercetin or isorhamnetin in inhibiting cytoplasmic lipid droplet accumulation. Significant differences (P < 0.05) were reported. Isorhamnetin was more effective than quercetin in inhibiting cytoplasmic lipid droplet accumulation. Neither quercetin nor isorhamnetin had an effect on the expression of macrophage chemoattractant protein-1 (MCP-1). C/EBPα enhanced binding protein α (C/EBPα) was downregulated by quercetin or isorhamnetin. Compared to control quercetin decreased PPARγ expression by 45.03% and 3.17% and 27.58±12.39%, while isorhamnetin decreased PPARγ expression by 41.48 ± 9.51% and 20.1% ± 32.46%, respectively. β-catenin was not dose dependent either for quercetin or isorhamnetin and did not follow a specific trend. Conclusions: Isorhamnetin more than quercetin at physiologically attainable concentration can exert potential anti-obesity effects by inhibiting differentiation of pre-adipocytes.
structing an engineered mouse that expresses one of these nuclear targeted
paramagnetic bead based purification of SUN1-RFP-Flag nuclei. We are con-
the nuclear membrane of cultured adipocytes. Further, we have confirmed the
Flag, SUN1-RFP-Flag, and RANGAP-GFP were all successfully targeted to

trolled expression of several different NETs in 3T3-L1 cells, during their

Background:
Obesity is characterized by increased adipose development in
muscle and bone marrow as well as an expansion of visceral adipose depots.
It is widely speculated that harmful differences in obese adipose tissue gene
expression are under epigenetic control. Considering that epigenetics is the
study of cell type specific differences in a developmental context, it is impor-
tant to examine isolated adipocytes from tissue. However, adipocytes repre-
sent only a small subset of cells in these tissues and they are too fragile to
isolate. Methods: We find adipocyte nuclei are relatively easy to isolate. We
are implementing an innovative new technology, INTACT (Isolation of Nu-
clei Tagged in Specific Cell Types), which will enable the rapid isolation of
adipocyte nuclei from any mouse tissue. We are expressing a transgenic Nu-
clear Envelope Proteins (NETs) fused to a fluorescent protein reporter (e.g.,
RFP) and an immunosetope tag (3xFlag) under control of the adipocyte-spe-
cific adiponectin promoter (ADNp). Results: We have tested the ADNp con-
trolled expression of several different NETs in 3T3-L1 cells, during their
differentiation into adipocytes. Engineered NETs, including Nesrin3-RFP-
Flag, SUN1-RFP-Flag, and RANGAP-GFP were all successfully targeted to
the nuclear membrane of cultured adipocytes. Further, we have confirmed the
paramagnetic bead based purification of SUN1-RFP-Flag nuclei. We are con-
structing an engineered mouse that expresses one of these nuclear targeted
nuclear membrane proteins. Conclusions: INTACT technology will enable
adipocyte nuclei from different tissues of normal and environmentally com-
promised mice or lean and obese mice on different diets to be purified from
VAT, SAT, muscle, or bone on anti-FLAG or anti-RFP paramagnetic beads
and their epigenetic differences examined.

T-671-P
In Vitro Characterization and Engraftment of Adipocytes Derived
from Human Pluripotent Stem Cells
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Background: Human induced pluripotent stem (iPS) and embryonic stem
(ES) cells can differentiate into a variety of cell types. We reported on adi-
pogenic potential of human iPS and ES cells in vitro. Methods: In the pres-
ent study, we investigate survival and maintenance of adipocytes
differentiated in vitro from human iPS and ES cells after transplantation.
Results: Following adipogenic induction in vitro, the differentiated cells ex-
hibited functional properties of adipocytes such as lipid storage, lipolysis and
insulin responsiveness. Subsequently, Matrigel containing the differentiated
human iPS and ES cells was transplanted into the subcutaneous tissue of
nude mice. After 1 to 4 weeks, the cells with adipocyte-like features were ob-
erved in transplanted Matrigel by histological analysis. The human origin of
the cells, their lipid accumulation and gene expression of adipocyte markers
in transplanted cells were then confirmed, suggesting the presence of
adipocytes in transplanted Matrigel. When the relative areas of these cells
were calculated, we found that they peaked at 2 weeks after transplantation,
and that the adipocytes persisted at 4 weeks. Furthermore, there was diversity
among cell lines with respect to the survival and maintenance of adipocytes.
Conclusions: The present study demonstrates that human iPS and ES cells
can differentiate into adipocytes with functional properties and that
adipocytes derived from human iPS and ES cells can survive and maintain
the differentiated properties of adipocytes for at least 4 weeks after transplanta-
tion. Adipocytes derived from human iPS and ES cells thus have the poten-
tial to open new avenues for stem cell-based research into metabolic diseases
and future therapeutic applications.

T-672-P
Ad36 May Require Insulin for Its Adipogenic Effect, but Not for
Enhancing Glucose Disposal
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Background: Obesity is often associated with inadequate insulin action or
quantity. In animal models, Ad36 - a human adenovirus, increases adiposity,
yet improves glycemic control. Ad36 bypasses the proximal insulin signaling
while increasing cellular glucose uptake by up-regulating AKT signaling. Of
the AKT isoforms, AKT1 is mainly linked with the induction of adipogenesis
and AKT2 with the induction of Glut4 and glucose disposal. We investigated
the modulation of AKT signaling and glucose uptake by Ad36 in the presence
or absence of insulin in human adipose derived stromal cells (hASC) - a cell
model of clinical relevance. Methods: Primary hASC obtained from 6 indi-
viduals were infected with Ad36 or mock infected. Glucose uptake, AKT sig-
naling and Glut4 protein abundance were determined in basal or insulin
stimulated conditions. Results: hASC obtained from several individuals re-
sponded similarly to Ad36. Ad36 increased basal and insulin-stimulated glu-
cose uptakes compared to respective mock groups by about 2-fold (p<0.0004).
Compared to the mock group, Ad36 enhanced the activation of
AKT1 only in presence of insulin. Whereas, Ad36 increased AKT2 activation
or Glut4 abundance in the presence or absence of insulin. Conclusions:
Ad36 may require insulin for its adipogenic effect, but not for enhancing glu-
cose disposal. Ad36 may provide a template to treat insulin resistance as well as
insulin deficiency. Funding: Vital Health Interventions
T-675-P
Androgenic Sex Steroids Contribute to Metabolic Risk Beyond
Intra-Abdominal Fat in Overweight/Obese Black and White
Women
Arlette C. Perry Coral Gables, FL; Xuexue Wang Columbia, SC; Ronald Goldberg Miami, FL; Robert Ross Kingston, Canada; Loreto Jackson Clemson, SC; Christopher H. Bailey Coral Gables, FL

Background: Visceral adipose tissue (VAT) and androgenic sex steroids have both been reported to contribute to metabolic risk. The purpose of this study was to examine the contribution of sex hormone binding globulin (SHBG), total testosterone (TT), and bioavailable testosterone using the free androgen index (FAI), to the variance in metabolic risk beyond VAT.

Methods: A total of 66 (36 white, 30 black) premenopausal overweight/obese volunteers soliciting a weight loss program were recruited (mean age = 40.1±8.6). A multiple regression interaction analysis was used after controlling for VAT. Results: Results showed SHBG contributed to the variance in insulin (P=0.003), insulin resistance using HOMA-IR (P=0.006) and high density lipoprotein-cholesterol sub-fraction 2 (P=0.029). TT contributed to the variance in systolic and diastolic blood pressure (P<0.001), total cholesterol (P=0.003) low density lipoprotein-cholesterol (P=0.003) and apolipoprotein B (P=0.004). FAI contributed to the variance in the greatest number of metabolic variables beyond VAT. A significant SHBG-race effect for insulin (P=0.039) and HOMA IR (P=0.01), TT-race effect for HOMA IR (P=0.035), and FAI-race effect for HOMA IR (P=0.01) were also found. There was also a significant FAI-race interaction for fasting glucose (P=0.013) with a Pearson’s correlation coefficient showing a significant relationship between FAI and glucose in white women (r = -0.48, P=0.003) while no relationship was found in black women (r = -0.01, P= 0.941). Conclusions: Our study showed that androgenic sex steroids contributed significantly to the variance in metabolic variables associated with health risk. However, androgenic sex steroids do not provide sufficient information relevant to insulin/glucose status in black women.

T-676-P
Dietary Phytochemicals Increase Brown Adipose Tissue Activity
in Adult Obese Rats
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Background: Brown adipose tissue (BAT) uncouples respiration, using lipids as an energy source while dissipating heat. Increases in BAT activity are protective against obesity, thus compounds that increase BAT activation may help prevent weight gain. Resveratrol (R) increases BAT activity by up-regulating thermogenic genes. As phytochemicals have synergistic properties, our research strategy has included investigation of the efficacy of relatively low concentrations of phytochemicals on BAT activation. Methods: Previously, we showed that R combined with genistein (G) and quercetin (Q) reduced weight gain in aged ovariectomized (OVX) female rats. In the current study, OVX rats were fed diets containing doses of phytochemicals with vitamin D (diet 1: 1000 mg/kg; diet 2: 500 mg/kg, 200 mg/kg R, and 1000 mg/kg Q; diet 3: 1000 mg/kg G, 400 mg/kg R, and 2000 mg/kg Q).

Results: After 16 weeks, rats in the high dose group had a significantly smaller scapular BAT depot compared to non-OVX controls (0.74 g ± 0.92 g; p=0.05). It was hypothesized that the reduction in BAT mass was due to phytochemical-driven increases in BAT lipid metabolism. After 16-weeks reduced lipid content in BAT of the high dose group was seen compared to non-OVX controls (0.35 ± 0.02 v 0.44 ± 0.04; p=0.01). Two-fold increases in BAT-related genes including Sirt3, Nrf1, and Pparα were observed in the high dose group compared to non-OVX controls (p<0.10). Similarly, Acsl expression was increased by 34-fold (p=0.02) and Lipe expression was increased by 29-fold (p=0.004) in the high dose group. Conclusions: These findings are consistent with our hypothesis that a dietary phytochemical blend increases energy utilization and respiration in BAT. These data provide further support for the anti-obesity effects of synergistic phytochemical combinations.

T-677-P
Leptin Transgenic Mice on Short-Term High Fat Diet Show Leptin Resistance without Obesity
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Background: Leptin resistance is seen in the almost all cases of human obesity. In animal models, high fat diet (HFD) is one of the most major causes of leptin resistance while the precise mechanism is still unknown. One of the reasons that make it difficult to analyze leptin resistance is coexistence of obesity and leptin resistance. Leptin resistance induces obesity and obesity itself modifies leptin resistance. In most animal models with high fat diet, leptin resistance coexists with obesity, making primary causes of leptin resistance obscure. In this study, we induced leptin resistance in the HFD-fed leptin transgenic mice that are lean by ectopically over-expressed leptin in the liver.

Methods: Wild type (WT) mice and leptin transgenic (Lep Tg) mice were fed standard chow or high fat diet (60% fat) for one week. They are sacrificed one hour after intraperitoneal leptin administrations (3mg/kg). Immunohistochemical analyses were performed with brain slices.

Results: One-week (1W) high fat diet increased body weight in Lep Tg mice. However, Lep Tg mice on 1W HFD were still not obese as compared with WT mice. Lep Tg mice on 1W HFD, but neither Lep Tg on chow nor WT mice on 1W HFD showed blunted suppression of food intake by exogenous leptin and decreased leptin-responsiveness of e-fox-immuno-reactivity, a marker of neuronal activation, in the arcuate nuclei.

Conclusions: Lep Tg mice on one-week HFD showed leptin resistance without obesity. They can be used as a tool for analyzing HFD-induced leptin resistance without secondary modification by obesity.

T-678-P
Weight Cycling Does Not Increase Relative Body Fat of Mice
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Background: To investigate age-dependent body composition changes with a diet-induced-obese (DIO) model including dietary restriction (DR) and long-term weight cycling in C57BL/6j mice. Methods: 555 singly-housed mice (1:1 M/F) were ad libitum (AL) fed a 45% high-fat diet from 2–11 months of age, with the 200 heaviest mice of each sex subsequently randomized to one of four groups: ever obese (EO, continued AL feeding), obese weight losers (OWL, diet restricted to a body weight similar to low-fat diet fed controls), weight cycling (WC, two weight-loss-and-regain cycles of diet restriction followed by AL-refeeding until stable weight). Body weight was monitored weekly. Body composition was measured at 23 and 43 weeks (W) of age and then at the time of each apex and nadir of WC body weight (~3 months intervals, 56w/nadir, 71w/apex, 84w/nadir, 99w/apex). Results: No significant differences in relative fatness (between EO and WC) were observed after either one weight cycle (71w, p=0.873/male, p=0.287/female) or two (99w, p=0.069/M, p=0.780/F). After one weight cycle, a sex difference in weight regain was observed that male WC had lower body weight (p=0.003), fat mass (p=0.004) and lean mass (p=0.006) compared with EO, with no differences between female WC and EO in body weight (p=0.258), fat mass (p=0.287) and lean mass (p=0.718). For the 2nd weight cycle, neither male nor female WC's had significantly different body weight (p=0.848/M, p=0.148/F) or fat mass (p=0.520/M, p=0.226/F) than their EO counterparts; however, male WC had significantly less lean mass than EO (p=0.018), with females showing a just significant difference (p<0.050). Conclusions: While sex differences existed in weight regain, repeated weight cycling did not increase relative fatness in either sex compared with those remaining obese.

T-679-P
Factors Distinguish Adipose Tissue of Insulin Sensitive and Insulin Resistant Obesity in Human and Mice
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Background: Although massively obese individuals undergoing bariatric surgery are usually insulin resistant (IR), some (~25%) are insulin sensitive (IS). The IR obese population is more prone to metabolic syndrome-associated diseases than their IS counterparts. We have reported that AMP-activated protein kinase (AMPK) activity is lower, and the expression of various
inflammatory genes as well as oxidative stress higher in adipose tissue of IR than BMI-matched IS population. However, the number of genes examined was limited. Methods: Visceral adipose tissue was obtained from morbidly obese patients undergoing gastric bypass surgery. Patients were stratified as IS (n=8) or IR (n=9) based on HOMA-IR (≥2.3 considered IR). A custom PCR array was used to investigate the association between insulin sensitivity and markers of inflammation, mitochondrial function, and other parameters. In parallel, epidymal fat obtained from diabetic db/db and littermate control mice were analyzed. Results: PCR array data confirmed and extended our previous findings. In addition, the expression of inflammatory genes including IL-1β, CD4, CD68, TLR4 was increased in the IR group, as well as collagen VI and TXNIP, the latter thought to be a link between cellular stress and inflammation. In contrast, markers of mitochondrial function had lower expression level in the IR group. Results from the db/db mouse model revealed parallel findings including systemic insulin resistance, diminished AMPK activity, increased oxidative stress, and activation of the inflammasome in adipose tissue. Conclusions: The results confirm and extend the observation that differences in AMPK activity, oxidative stress, and inflammatory gene expression distinguish IS vs IR obesity. They also suggest that changes qualitatively similar to those in adipose tissue of the IR patients occur in the db/db mice.

T-680-P
Leptin: Adiponectin Ratio among Patients with Cancer
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Background: Two-thirds of Americans are overweight or obese, a condition defined by the excess accumulation of adipose tissue. Among other risks, such as cardiovascular disease and diabetes, the presence of excess fat is associated with increased risk for cancer; additionally it can cause an adipokine imbalance. The purpose of this study was to determine leptin:adiponectin (L:A) ratio among different malignancies in a population undergoing FDG-PET/CT scans. Methods: A convenience sample of patients undergoing FDG-PET/CT scans were recruited and enrolled (n=181). Age, sex, and cancer diagnosis were obtained; height, weight and fasting serum adiponectin and leptin were measured. BMI and L:A ratio were calculated. Analysis of Variance (ANOVA) was performed to determine differences in L:A ratio among the different malignancies (breast, colorectal, esophageal, lung, multiple myeloma, lymphoma, other). Results: Mean age was 59 ± 14 years, 72 were female. Mean BMI was 28.6 ± 10.6. The malignancies with the highest prevalence were multiple myeloma (n=48), colorectal (n=28) and lymphoma (n=26). L:A ratio was highest in those with lymphoma (14.7 ± 8.1), breast (13.3 ± 12.5) and colorectal cancer (13.3 ± 18.4); and lowest in those with lung (6.4 ± 7.3) and esophageal cancer (7.3 ± 6.1), but the difference among malignancies was not statistically significant. Conclusions: Excess adipose tissue causes a dysregulation of adipokines, which has myriad physiological effects, including an increased risk of malignancy. This process may be mediated by inflammation due to metabolic dysregulation and adipokine imbalance, but proposed mechanisms are still speculative.

T-681-P
Effects of Lycopene-Rich Lipidic Tomato Extract in a Hormonal Model of Benign Prostate Hyperplasia in Obese Male Wistar Rats
Juventino Colado-Velazquez, Josue V. Espinosa-Juarez, Patrick Mailoux-Salinas, Beatriz Guillen-Garcia, Osmar A. Jaramillo-Morales, Guadalupe Bravo Mexico, Mexico
Background: Obesity has been linked to an increase in the incidence and prevalence of prostate disease. Current therapy has adverse effects affecting the life quality of patients. New therapeutic alternatives have been proposed such as lycopene, which can be found in lipidic tomato extract. Methods: 36 Male Wistar rats were randomized in 6 groups. Control animals were given standard laboratory animal diet and water while obese were given 30% sucrose instead of water ad libitum for 44 weeks. On the 36th week, testos- terone enantate (4 mg/kg) was administered weekly to induce prostate hyperplasia for 8 weeks. On the 40th week, treatment with lipidic tomato extract (5 mg/kg/day) was performed for 4 weeks. After treatment, the animals were sacrificed by decapitation. Blood and organs were extracted, weighed and assays were performed: Total nitrites, malondialdehyde, blood glucose, triglycerides, HDLc, LDLc. Results: Obese rats had significantly higher prostate weight than the hyperplastic controls and untreated controls. Treatment with lycopene significantly decreased prostate weight in obese groups, but did not have a significant effect in control animals. Bladder and testicle weight did not change significantly by the treatment. Obesity increased LDLc and triglycerides, while decreasing HDLc significantly. Treatment with the extract significantly decreased LDLc and increased HDLc. Obese animals had signiﬁcantly higher on homocysteine and MDA compared to control. Conclusions: Lycopene has beneﬁcial effects reversing prostate size and improving biochemical parameters in blood. Its antioxidant effect also improves markers of oxidative stress such as Nitric Oxide and MDA, potentially decreasing cell damage and inﬂammation. More research is needed to clearly describe the effects of lycopene in obesity.

T-682-P
Effects of Sabal Serrulata and Lycopene in Prostate Health in Obese Male Wistar Rats
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Background: Prostate disorders are highly prevalent in male patients aged 50+. Obesity is a risk factor in the development of benign prostate hyperplasia. Lycopene and Sabal serrulata extracts have been proposed as therapeutic alternatives with less adverse effects than the standard therapy. Methods: Male Wistar rats were randomized into 6 groups. Obesity was induced with hypercaloric diet (30% sucrose in water), control animals only received water; both groups were given standard laboratory chow for 44 weeks. At week 40 treatment with Sabal s. (25mg/kg/day) and lycopene (5 mg/kg/day) was performed, controls received vehicle (corn oil) for 4 weeks. The animals were sacrificed; prostate and bladder were excised and prepared into isolated organ chambers for contractility testing with norepinephrine (NE), acetylcholine (Ach) and isoprenaline (ISO). Slices of these organs were fixed in paraffin for histopathological evaluation. Results: Prostate weight was significantly higher in obese animals. The extracts significantly reduced the weight of the prostate. Obesity significantly increased NE contractility of prostate samples compared to control; treatment significantly reduced contractility to levels comparable to control. There was significant difference in bladder contractility to ISO while no difference to Ach between obese and control. The extracts did not have a significant effect in bladder contractility. Histopathology from obese animal prostate showed stromal and epithelial hyperplasia. Treatment with both extracts showed a marked decrease in hyperplasia. There were no changes in control tissues. Conclusions: Both extracts had a beneficial effect improving prostate contractility and reducing its weight/size in obese animals while not affecting controls. The use of these extracts may be beneficial in treating or preventing prostate disease in obese patients.
HUMAN ADENOVIRUS AD36 AND ITS E4 ORF1 GENE ENHANCE CELLULAR GLUCOSE UPTAKE EVEN IN PRESENCE OF INFLAMMATORY CYTOKINES

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**Background:** Obesity is often linked with insulin resistance via a chronic preponderance of pro-inflammatory cytokines such as MCP1, or TNFα. Attempts to improve insulin resistance with anti-inflammatory agents have yielded marginal benefits. If any, Ad36—a human adenovirus, improves high-fat diet induced hyperglycemia in obese mice. The E4orf1 gene of Ad36 enhances cellular glucose uptake in vitro by up-regulating the phosphatidylinositol 3-kinase (PI3K)/Glut4 pathway of insulin signaling. Here, we tested if Ad36 or E4orf1 will enhance cellular glucose uptake in presence of inflammatory cytokines. Methods: A) 3T3-L1 preadipocytes were treated with TNFα (0, 20 ng/mL) or MCP1 (0, 25 ng/mL) and then infected with 0 or 5 particles/cell of Ad36. B) 3T3-L1 cells that indolently express E4orf1 or a null vector were treated with TNFα or MCP1 as above, followed by the induction of E4orf1 with doxycycline treatment. Cellular uptake of 2-deoxy glucose was measured, and the PI3K signaling was determined. Results: In the mock control groups, TNFα or MCP1 decreased glucose uptake and down-regulated PI3K signaling as indicated by reduced AKT-phosphorylation, and decreased GLUT4 abundance. Whereas, Ad36 infection or E4orf1 expression increased glucose uptake in presence of MCP1 or TNFα (all p<0.0002) and up-regulated AKT-phosphorylation and GLUT4 abundance. Conclusions: Ad36, and particularly E4orf1, may provide a valuable template to improve hyperglycemia even in presence of chronic inflammation. Funded by Vital Health Interventions.

**T-685-P**

THE ROLE OF NEUROMEDIN U IN GLUCOSE HOMEOSTASIS

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**Background:** Neuromedin U (NMU) is a peptide that has been implicated in central energy homeostasis and a wide variety of physiological role, including smooth muscle contraction, stress response, and pro-inflammatory response. In previous reports, NMU deficient mice (NMU-KO) showed increased body weight and adiposity, hyperphagia, decreased energy expenditure, and fatty liver. Though these mice also showed normoglycemia, the role of NMU in glucose homeostasis remains unclear. We speculate that NMU is involved in diet-induced insulin resistance via inflammatory signals. Methods: We fed NMU-KO and wild type mice (WT) high fat diets from the age of 8 weeks, and examined metabolic parameters and inflammatory signals at 35 weeks. Results: Body weight was significantly increased in NMU-KO compared with WT with increased fat mass. There was no significant difference in food intake and energy expenditure between the two genotypes. Postprandial glucose and insulin levels were significantly decreased in NMU-KO compared with WT. In glucose tolerance test, blood glucose levels tended to be lower in NMU-KO than in WT. In insulin tolerance test, hypoglycemic response to insulin injection was significantly enhanced in NMU-KO compared with WT. Messenger RNA expressions of IL-6 and IL1b in adipose tissue and the number of F4/80-expressing cells in fat tended to be lower in NMU-KO compared with WT. Conclusions: These results demonstrate that NMU is involved in diet-induced insulin resistance by promoting inflammatory signals in adipose tissue.

**T-686-P**

PROFILE ANALYSIS OF INFLAMMATION STATE BETWEEN HUMAN ADENOVIRUS 36-INDUCED OBESITY AND DIET-INDUCED OBESITY

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**Background:** Obesity is associated with a state of chronic low-grade inflammation. Previous studies have supported the theory that immune cells, especially adipose tissue macrophage (ATM), and inflammasome, are related to the development of obesity. We recently reported that adipogenic human adenovirus 36 (Ad36) can trigger acute and chronic inflammation and that this inflammation is required to stimulate adipogenesis. In here, we compared Ad36-induced obesity (AOI) and diet-induced obesity (DIO) via analysis of the ATM population (M1 and M2 ATM) and inflammasome activation in both early and late stages of obesity. Methods: Epididymal (e) fat tissue was harvested from AOI or DIO mouse models 7 days (early stage) and 90 days (late stage) after Ad36 infection or high fat diet (HFD) for further studies. Results: During the early stage, total ATM and M1 ATM increased only in AOI but not in DIO. Moreover, inflammasome activation was observed in only AOI. During the late stage, total ATM and M1 ATM population were increased in both AOI and DIO. Also, inflammasome was activated in both AOI and DIO. Conclusions: Whereas AOI showed inflammatory status via a lapsed toward M1 and inflammasome activation during the early stage, DIO did not. However, both AOI and DIO stimulated chronic inflammation and inflammasome activation during the late stage. Therefore, increases of M1 and inflammasome activation in e fat tissue may have a role in both AOI and DIO.

**T-687-P**

SEPsis ALters the Signal Transducer and Activator of Transcription 3 (STAT3) and Nuclear Factor kappa B (NF-κB) Pathways in White Adipose Tissue

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**Background:** Obesity increases rates of sepsis. Our previous data demonstrate that obesity enhances inflammation and increases mortality after experimental sepsis. We hypothesize that sepsis alters adipose tissue inflammation through alteration of pro-inflammatory mediators and is affected by obesity. Methods: C57BL/6 mice (6wk old) were randomized to HFD (60% kcal fat) or a control diet (CD) (16% kcal fat). After 8wks of feeding, polymicrobial sepsis was induced by cecal ligation and puncture (CLP). Mice were sacrificed at 0 or 6h after CLP. Plasma and white adipose tissue (WAT) were obtained for analysis. p=0.05 was significant. Results: Following 8wks of feeding, HFD mice had greater body weights, fat mass and plasma leptin levels compared to CD (p=0.05). After CLP, leptin increased in both diet groups but was significantly higher in obese mice. Plasma TNFα increased in both groups after CLP but was lower in obese compared to control mice (136±13 vs 186±29 pg/mL, p=0.05 by ANOVA). To understand the molecular mechanisms in WAT that contributes to systemic inflammation we investigated the NFκB pathway. At western blot, inhibitor κB (IκBκ) expression was lower in WAT from obese compared to control mice at baseline (0.8±0.09 vs 1±0.07 relative units, p<0.05). However after the induction of sepsis IκBκ was lower in both groups and not affected by diet. Surprisingly, NFκB DNA binding activity decreased after CLP in both groups. Leptin induces signaling through the JAK/STAT pathway therefore we explored activation of pSTAT3 expression. WAT pSTAT3 was increased in both control and obese groups after CLP compared to baseline (8.5 vs 1.2 relative units and 8.8 vs 1.8 relative units, p=0.05 respectively) but not affected by diet. Conclusions: The leptin changes in sepsis may alter WAT expression of the STAT3 and NFkappaB pathways. (NIH K08GM093135; P30DK078392).

**T-688-P**

STEATOSIS PROGRESSION, WITHOUT OXIDATIVE STRESS AND INFLAMMATORY RESPONSE, DID NOT ALTER THE CARDIAC PERFORMANCE IN DIET-INDUCED OBESE RATS

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**Background:** Recent evidences suggest that non-alcoholic fatty liver disease is a risk factor for cardiovascular disease, including cardiac dysfunction. However, this relationship is inconsistent. This study evaluated whether chronic nutritional overload promotes hepatic steatosis and inflammation

For author conflict of interest information, see page S264 www.obesityweek.com
T-690-P  Phlorizin Prevents, but Not Reverses High Fat Diet-Induced Obesity and Hepatic Steatosis in Mice
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Background: Oxidative stress has been considered as the link between obesity and obesity-associated disorders, and recent studies have suggested that antioxidants may have beneficial effect on preventing and reversing obesity and obesity related disorders. The objective of this study is to examine the activity of phlorizin, a natural antioxidant found in apple leaves, in preventing and reversing the high-fat diet-induced obesity and hepatic steatosis in mice. Methods: C57BL/6 mice were fed a high fat diet (60% KJ from fat, 20% from carbohydrates and 20% from proteins) for 12 weeks. Preventive effect of phlorizin on high fat diet-induced obesity was studied by twice weekly i.p. injections of phlorizin (10 mg/kg) or dimethyl sulfoxide as control (n=5/group). Therapeutic effect of phlorizin was assessed on mice pre-fed a high fat diet for 6 weeks, and then injected i.p. phlorizin for 6 weeks. Body weight, food intake and body composition were monitored on these treated animals and compared to control. Serum concentrations of insulin, glucose and fats, and insulin sensitivity and glucose tolerance assay were performed to assess the effect of phlorizin on glucose and lipid metabolism. Histochemistry analysis of the liver and adipose tissue was performed on treated animals and the results compared to control animals. Results: Twice weekly injection of phlorizin blocked high fat diet-induced weight gain and hepatic steatosis, but no therapeutic effect of phlorizin was observed with the similar treatment of animals pre-fed with a high fat diet. Phlorizin did not reverse the fatty liver in the obese mice. Conclusions: Phlorizin may be used to prevent and alleviate high-fat diet-induced obesity and liver steatosis.

T-691-P  E4orf1, A Novel Viral Protein That Improves High Fat Diet Induced Hyperglycemia in Mice
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Background: Adipogenic human adenovirus Ad36 is linked with better glycemic control and lower hepatic steatosis in animals and humans. In mice, Ad36 improves hyperglycemia without reducing dietary fat or obesity, a potentially attractive property, given the limited success of common weight loss strategies. In vitro studies credit the anti-diabetic effects of Ad36 to its E4orf1 gene. To test its role in vivo, we used replication deficient viral vectors to transiently express E4orf1 in mice. Methods: Mice fed a 60% fat diet were inoculated with pBabe retrovirus expressing E4orf1 (pBabe-E4), either intra-peritoneally (IP) alone, or IP, intra-muscularly, and subcutaneously (multi-site; MLT). The control group (CON) was inoculated with pBabe expressing null vector. In another experiment designed identically, mice were inoculated with adenov-associated-virus (AAV) expressing E4orf1 (AAV-E4) or a null vector (AAV-CON). Results: pBabe-E4 infected mice significantly attenuated the rise in glucose during glucose tolerance tests (GTT) at 1 and 2 wk post infection(p), vs CON. The MLT group, which showed the greatest response, had 80% less area under the curve (AUC) for GTT vs CON (p<0.03) on wk 1. As expected from transient gene expression, the effect of E4orf1 on GTT declined after wk 2 or 3. Upon sacrifice 5 wk pk, adipose tissue of the pBabe-E4 group expressed E4orf1 and significantly increased adiponectin mRNA vs CON. Mice inoculated with AAV-E4 also reduced the AUC for GTT by 63% (MLT, p<0.05), vs AAV-CON. Conclusions: This study creatively exploited the beneficial properties of a virus, by selectively harnessing its E4orf1 protein to improve hyperglycemia, a frequent comorbidity of obesity. This proof of concept study provides critical confirmation
to advance the development of E4orf1-based anti-diabetic treatments. Funding: Vital Health Interventions.

**T-693-P**

**Associations between Tissue Retinol Binding Protein-4 Levels and Insulin Resistance in Morbidly Obese Subjects**

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**Background:** Retinol binding protein-4 (RBP-4) is a pro-inflammatory factor and may play a role in insulin resistance. The association between tissue RBP-4 concentrations and insulin resistance is not completely understood. The objectives of this study were to measure RBP-4 concentrations in blood, liver, muscle, subcutaneous, omental, and mesenteric adipose tissues in morbidly obese subjects, and investigate their relationship to insulin resistance.

**Methods:** Blood and tissue samples were collected from 38 morbidly obese subjects (BMI ≥ 40 kg/m2) by a surgeon during the Roux-en-Y surgery. Blood lipids and insulin resistance biomarkers were measured using standard methods. Gene expression and protein concentrations of RBP-4 in tissues were measured using real time PCR and ELISA kit, respectively. Results: Based on blood hemoglobin A1c (HbA1c) concentrations, subjects were divided into non-diabetic (n=13), pre-diabetic (n=12) and diabetic (n=13) groups. Diabetic subjects had significantly higher blood glucose concentrations and Homeostasis Model of Assessment-Insulin Resistance (HOMA-IR), and lower blood HDL-cholesterol concentrations than non-diabetic and pre-diabetic subjects. Blood and tissue RBP-4 concentrations were similar among these three groups. Liver had the highest RBP-4 concentrations, followed by muscle, subcutaneous, omental, and mesenteric adipose tissues in a decreased order. Omental adipose RBP-4 gene expression levels were positively associated with HOMA-IR (r=0.355, p=0.029). Liver RBP-4 concentrations were positively associated with blood glucose concentrations (r=0.363, p=0.025).

**Conclusions:** Liver had the highest RBP-4 concentrations among 5 collected tissues, and liver RBP-4 may have a modest role in insulin resistance.

**T-694-P**

**A High-Pufa Fat Diet Attenuates the Deleterious Metabolic Effects of a High-Saturated Fat Diet Associated with Partial Lipectomy**

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**Background:** Increased visceral fat is directly associated with increased cardiovascular risk. Experimental studies demonstrated that its partial removal is associated with improvements in some risk parameters. However, when associated with a high-saturated fat diet, lipectomy has been shown to lead to deleterious effects (i.e., increased insulin resistance). The aim of this study was to investigate the effects of the partial removal of visceral fat on metabolic risk factors in rats fed different types of high-fat diets.

**Methods:** Male Sprague-Dawley rats were randomized into four groups: high-saturated fat/diabetic control (HF), high-saturated-fat/lipectomy (HSL), high-saturated-fat/sham-lipectomy (HSS), high polyunsaturated-fat/lipectomy (HPL), high polyunsaturated-fat/sham-lipectomy (HPS). Eight weeks after the diet lipectomy was performed. Body weight, food intake, fasting glucose and glycose tolerance were assessed before and three weeks after the lipectomy.

**HOMA index, hepatic lipid content, adiposity and lipid profile were assessed after the interventions.** Results: HSL and HSS showed impaired glucose tolerance and impaired insulin resistance when compared to the other groups (p<0.05). HSS and HPS showed increased total adiposity and epididymal fat whereas HPS also showed increased brown fat content (p=0.05). HSL showed increased hepatic lipid content when compared to all groups (p=0.02). Lipoprotein per se induced increased hepatic fat content. PUFA-rich diet showed a protective effect increasing brown adipose tissue content while not inducing the negative effects of saturated-fat diet such as insulin resistance, retroperitoneal compensatory growth, increased cholesterol levels or increased hepatic fat content as caused by lipectomy. Conclusions: So we suggest that lipoprotein associated to saturated-rich diet exerted deleterious effects while polyunsaturated-rich diet seems to prevent it.

**T-695-P**

**Chlorogenic Acid Suppresses High Fat Diet-Induced Inflammation and Hepatic Steatosis**

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**Background:** Coffee polyphenols have been shown to have various health-protective effects, such as suppressing fat accumulation, inhibiting hyperglycemia and hyperlipidemia. Chlorogenic acid (CGA), the most abundant epigallocatechin in coffee, also exerts hypoglycemic effect and regulates lipid metabolism. The objective of this study is to assess the mechanism of chlorogenic acid-mediated protection on high fat diet-induced obesity. Methods: A series of q-PCR analysis was performed in tissue of C57BL/6 mice fed a regular chow or high fat diet for 15 weeks with or without twice weekly injections of CGA (p.p., 100 mg/kg) or dimethyl sulfoxide (carrier solution), in conjunction with physiological and biochemical measurements of body weight, body composition, fat content in the liver, serum glucose, insulin level, and levels of inflammatory cytokines. Results: Chlorogenic acid-treated animals showed significant reduction of inflammation in adipose tissue, as evidenced by low levels of macrophage markers F4/80, CD68, CD11b, CD11c and inflammatory factors TNFα and Mep-1. CGA treatment also reduced hepatic inflammation in obese mice and attenuated diet-induced hepatic steatosis by suppressing triglyceride and total cholesterol levels in the liver and reducing hyperlipidemia. At physiological level, chlorogenic acid blocked high fat diet-induced gain of fat mass by 70% without change of their lean mass. Analysis of genes involved in lipid metabolism showed CGA markedly reduced lipid transporter Cpt1 expression and increased Pparg and Fgf21 mRNA level. In addition, CGA improved hyperinsulinemia and hyperglycemia, and inhibited diet-induced pancreatic insulin gene expression. Conclusions: The results support that supplementation of CGA exerts a preventive role in diet-induced obesity and improves obesity-related inflammation and hepatic steatosis.

**T-696-P**

**Effect of Short and Long-Term High-Fat Diet on Modulation of Hepatic Lipogenesis in Rats**

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**Background:** The development of fatty liver in insulin resistant obesity suggests that insulin-stimulated hepatic fat synthesis is preserved despite impaired control of gluconeogenesis. Insulin regulates the expression of SREBP-1c and its conversion to the mature form, which regulates transcription of genes for the lipogenic enzymes Fatty Acid Synthase (FAS) and Acetyl-CoA Carboxylase (ACC). Methods: We fed male Sprague-Dawley rats a high-fat (HF; 55% of kcal as fat) diet for 1 or 10 wk to produce fatty liver, or a control low-fat (LF;15%) diet. Liver samples were obtained from rats after a 24 hr fast or after a fast and refeeding for 16 hr with a 55% carbohydrate meal. Results: At wk 1, refeeding increased 1) plasma insulin levels 2X in both groups; 2) SREBP-1c, FAS and ACC mRNA more in LF than HF rats; 3) SREBP-1c precursor protein in both groups, but mature SREBP-1c only in LF; 3) FAS and ACC protein markedly in HF but not LF; and 4) mTORC1 activity in both groups. At wk 10, refeeding still increased SREBP-1c, FAS and ACC mRNA more in LF than HF rats, but failed to increase levels of SREBP-1c, FAS or ACC protein, or mTORC1 activity in either group. Conclusions: The enhancement of synthesis of lipogenic enzymes in HF rats at wk1, perhaps via mTORC1 effects on translation, was no longer observed in older animals. Decreased induction of lipogenic genes by refeeding at both wk 1 and 10 indicates an early and persistent defect in control of lipogenesis in HF diet-induced fatty liver.

**T-697-P**

**Developmental Origins of Distal Tubular Damage and Type 2 Diabetes in Fatty Zucker Rats and Protection of Leptin Deficient Fatty Rats by Brown Norway Alleles on Chromosome 1**

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**Background:** Fatty Zucker rats are homozygous for a Leptin Receptor (Lep-rfa/fa) mutation on chromosome 4. Fatty Zucker rats develop type 2 diabetes and renal disease. We bred a fatty ZUC-BN-Chr1 congenic homozygous for Lep-rfa/α, which is 95% identical to Zucker fatty rats except half of chromosome 1 is derived from Brown Norway (BN). Type 2 diabetes and renal disease are reduced in the congenic. Methods: Male fatty Zucker and fatty BN chromo-
some 1 congenic animals were phenotyped at 9, 15 and 28 weeks of age. RNAseq from kidney, liver and retroperitoneal fat tissues was performed. Also measured were12 urinary protein markers of glomerular and tubular disease (Myriad RatKidneyMAP), and urinary metabolites by NMR. Results: Positional candidate genes at congenic region QTL peaks that have high fold differences congenic vs Zucker have been identified. ACSM5 is 12-14-fold higher congenic-Zucker in fat tissue and 54-139-fold higher congenic-Zucker in liver all ages. Differences in kidney were not found. ACSM adds AcylCoA to 4-11 carbon fatty acids in mitochondria. A SNP near uroruladin and ACSM5 is associated with glomerular filtration rate in humans. 4-times more EGF was lost per day in congenic than Zucker urine at 28 weeks (p<0.0003). 2-15-fold more GST-t was lost per day by Zucker than congenic rats (p<0.0008). Both results suggest distal tubular damage in the Zucker strain. No other significant effects were observed. Zuckers had increased urine urea at all time points (p<0.0001). Zuckers also lose 3-4 times more myo-inositol (p<0.0001). 5-10 fold more glucose and 3-4 fold more creatine (p<0.0001) than congenics. Fasted serum glucose and BUN were lower in congenics.

Conclusions: The chromosome 1 BN donor region protects animals that are fatty Lepr/fa from distal tubule disease and type 2 diabetes. Supported by Nora Eccles Treadwell Foundation
weeks, mice injected ip. with nicotine (3mg/gx4 qhr) and mice treated with both. Results: CB1R levels in the hypothalamus were ~40% lower than in the hippocampus. The expression was slightly higher in the arcuate and lateral nuclei compared with paraventricular and ventral-dorsal medial hypothalamic nuclei. Next, we analyzed if HFD nor nicotine alone altered CB1R levels in any of the nuclei tested. In contrast, treatment of HFD-fed mice with nicotine led to a significant increase in CB1R levels in the arcuate, paraventriculat and lateral nuclei. Such a response was not observed in the expression of neuropeptides or melanocortin receptors. Melanocortin receptor agonist MT-II as well as nicotine suppressed body weight in HFD-fed mice. However, MT-II did not show any effect on CB1R expression. Conclusions: CB1R mRNA is distributed in multiple hypothalamic nuclei and the level is augmented by the combination of HFD and nicotine, suggesting a possible interaction between dietary fat overload and tobacco smoking in the regulation of CB1R expression in the brain.

T-702-P

Novel Melanocortin 4 Receptor (MC4R) Gene Mutations in Pediatric Obese Patients

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Background: Melanocortin-4 receptor (MC4R) plays critical roles in regulating food intake and energy balance. Mutations in the MC4R are the most common cause of monogenic human obesity. Alabama has the highest rate of overweight and obesity in the nation. Therefore, we have a unique opportunity to use this extraordinary resource to determine genetic polymorphisms of MC4R gene and investigate the impact of genetic variants on the obesity development and outcome of different treatment. Methods: Clinical and biochemical characteristics of the 84 pediatric obese patients were obtained with BMI > 40 kg/m2. Blood samples were obtained and the coding region of MC4R was amplified by PCR and all PCR products are fully sequenced. To examine the function of the mutated MC4Rs, single MC4R mutation was constructed. Standard ligand binding and cAMP assays were performed. Data are expressed as mean ± SEM. Student t test was used for statistical analysis, with p < 0.05 considered to be statistically significant. Results: In this study, we have identified four new mutations (E100K, F202V, K242H, and C277-stop) in pediatric obese patients. Our functional study indicates that the mutation of the C277-stop is not expressed at cell surface and NDP-MSH does not bind to this receptor. Two mutations (E100K and K242H) significantly decreased receptor expression and function while F202V only decreased receptor expression (P<0.05). Conclusions: MC4R mutation altered receptor function. Mutation E100K is located in the NDP-MSH binding site in which mutation affects ligand binding and signaling. This study provides important insight into the key role of MC4R mutation in human obesity development.

T-703-P

Molecular Insight Into the MC4R Mediated Biased Signaling by Different Agonists

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Background: The melanocortin-4 receptor (MC4R) plays a key role in the regulation of food intake. alpha-MSH binds to MC4R and activates cAMP, calcium and MAPK pathways, whereas MC4R synthetic agonist THIQ only activates cAMP pathway. The molecular basis of the MC4R for this ligand selectivity is unknown. We hypothesize that different MC4R agonist can stabilize different MC4R conformation which links to different signaling events. To test this hypothesis, we utilized the metal-ion chelator approach to determine receptor conformation change by cross-linking two transmembrane helices (T3M and T6M) and thus inhibiting receptor activation when Zn++ is present. Twenty single or double mutations were created at the end of T3M and beginning of the T6M. Standard ligand binding and cAMP assays were performed. Student t test was used for statistical analysis, with p < 0.05 considered to be statistically significant. Results: Twelve single mutations and eight double mutations at the end of T3M and beginning of the T6M of the MC4R were tested. Our results indicate that these single or double mutations did not significantly alter NDP-MSH or THIQ binding affinity and potency. However, the receptor activation by THIQ, not NDP-MSH, is blocked by adding Zn++ in the medium at the double mutation I150+248H, suggesting that this mutation might induce different receptor conformation change compared to that of NDP-MSH. Conclusions: Our results suggest that NDP-MSH and THIQ activate different signal pathways by inducing different receptor conformation changes. This study provides insight into the molecular mechanism of why different MC4R agonists can induce different receptor signaling pathway.

T-704-P

Gene Expression Profiling of Single Amylin-Activated Neurons in the Rat Area Postrema

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Background: Amylin belongs to the calcitonin gene related peptide family and is co-secreted with insulin in response to feeding. Amylin acts as satiety signal to inhibit food intake by activating area postrema (AP) neurons. Amylin displays strong binding to the AP. One identified component of the amylin receptor belongs to the family of the seven transmembrane G protein-coupled receptors, the calcitonin receptor (CTR). High affinity amylin binding requires the co-expression of CTR with a member of the receptor activity modifying proteins (RAMPs) 1 or 3. The coupling of these two subunits forms AMY1 or AMY3 receptors, respectively. CTR, RAMP1 and RAMP3 are expressed in the rat AP; however, it has never been demonstrated that all components are present in a single cell. Methods: We therefore used laser capture microdissection (LCM) to discriminate between different neuronal populations and to analyze them at the single cell level. To identify if receptor subunits are expressed in one amylin-activated neuron, c-Fos immunohistochemistry coupled with LCM and real-time quantitative PCR (RTqPCR) were performed. Male Wistar rats were treated with amylin (20 μg/kg, i.p.). Ninety minutes later, genetic polymers were embedded in OCT and snap-frozen in cold isopentane. Subsequently, brains were cut at 10 μm thickness on a cryostat. c-Fos-positive single cells were immediately processed under LCM; single cells were captured and RNA was extracted, purified and amplified. Expression profiling of mRNA was done by using RTqPCR to provide a real-time evaluation of gene expression in the rat AP. Results: CTR mRNA and RAMP 1 and 3 mRNA were detected in a single amylin-activated neuron collected from the rat AP. Conclusions: Hence for the first time, we demonstrate that CTR and RAMP1 and 3 are expressed in a single, amylin-activated neuron in the rat AP.

T-705-P

Synergistic Effects of PYY(3-36) and Liraglutide on Food Intake and Body Weight, Possibly Mediated by Altered Arcuate Y Receptor Expression

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Background: Glucagon-like peptide-1 (GLP-1) and Peptide YY (PYY) are co-released from enterococellular L-cells. Both act as postprandial satiety signals and reduce appetite and inhibit food intake. It is likely that both GLP-1 and PYY act on centrally located receptors, but the exact sites of action and the molecular mechanisms involved remain to be determined. Methods: Here, we assessed the combined effect of the once-daily GLP-1 analog liraglutide (LIRA) and PYY(3-36) on body weight in diet induced obese (DIO) hamsters. Liraglutide is in phase 3 clinical development for the treatment of obesity. Next, obese DIO C57BL/6J mice were treated with LIRA (0.2 mg/kg/bidaily) for 14 days and subsequently analyzed for Y1, Y2, Y5 receptor expression in the hypothalamus using semi quantitative in situ hybridization. Results: Whereas LIRA (0.2 mg/kg/bidaily) and PYY3-36 (1mg/kg, s.c. osmotic micropumps) showed a statistically significant 11% and 7% weight loss, respectively, compared to vehicle (veh), co-administration of the two peptides led to a marked synergistic 32% effect on weight loss following 16 days of dosing. The synergistic effects of LIRA and PYY3(3-36) on body weight prompted us to examine a potential cross-talk between GLP-1 receptor and Y receptor signaling pathways in the hypothalamus. Interestingly, we found that LIRA treatment lowered the orexigenic Y1 receptor mRNA levels by 34% versus veh (4.8±0.91 LIRA versus 6.79±0.73 veh) and increased the anorexigenic Y2 receptor expression by 18% (7.3±1.55 LIRA versus 5.51±1.25 veh) in the arcuate nucleus known to harbor GLP-1 receptors – but not in the paraventricular nucleus which also has GLP-1 receptors. Conclusions: In conclusion, the LIRA-induced shift in Y-receptor balance could potentially explain the synergistic effects on body weight of co-administered LIRA and PYY3-36.
higher in the primate than in the rodent. Differences, including the amygdala, where GLP-1R expression was much lower in the rodent than in the primate, were seen in the brainstem, the highest concentrations were in the area postrema, NTS, and dorsal motor of the vagus. Overall, there was very good correlation in the receptor distribution characterised by the three different techniques. Importantly, the level of receptor expression was in areas involved in the regulation of food intake, which correlates well with the functional role of this system. Finally, while there were strong similarities in the distribution of GLP-1R between the rodent and macaque, there were a few key areas of differences, including the amygdala, where GLP-1R expression was much higher in the primate than in the rodent.

**Conclusions:** In conclusion, GLP-1R in the non-human primate brain is mainly distributed along the functional continuum of nuclei and areas involved in appetite functions.
Emotional-induced eating, perhaps via changes in gut hormones such as ghrelin, may reflect the stress alleviating effects of food consumption underlying decreased activation from Fasted to Fed state ($r=+0.45$–$0.59, P=0.01$–$0.06$), and the activations to unpleasant pictures when Fasted ($r=+0.57$–$0.72, P<0.01$), and the activations between DS-R (but not DEBQ-emotional eating) and BOLD activation to unpleasant images was significantly lower when Fed than Fasted ($P=0.2$–$0.8$).

Background: Obesity and fasting may alter food hedonics and brain reward network (SALN) involving insula, ventral anterior cingulate (vACC) and orbitofrontal (OFC) cortex, regions also activated by food cues. We hypothesised that the SALN is altered in obesity and by feeding state. Methods: 83 adults (64% male, mean ± SD age 33.2 ± 10.7y, BMI 19.1-53.1 kg/m², 29 lean, 28 overweight, 26 obese) had 10min resting state fMRI after an 83±0.7kg overnight (~16h) and when fed (110 min after ingestion of a 1200 kCal liquid meal) in a randomized, cross-over design. Correlations of ROI activation were made with trait measures of disgust sensitivity (DS-R) and emotional eating (DEBQ). Results: BOLD activation to unpleasant images was significantly lower when Fed than Fasted ($P=0.045$–$0.59, P=0.01$–$0.06$), in the amygdala, insula, OFC and hippocampus. Conclusions: Brain responses to negative emotional stimuli are attenuated after food intake, which may reflect the stress alleviating effects of food consumption underlying emotional-induced eating, perhaps via changes in gut hormones such as ghrelin.

T-711-P
Salience Resting State Network Integrity Is Increased in High-Calorie Food Cues Jonathan A. Starke, Mustafa Anjari, Christina G. Prechtl, Samantha Schultz, Alexander D. Miras, Navpreet Chhina, Giuliana Durighel, Michelle L. Sleeth, Gary Frost, Jimmy D. Bell, Anthony P. Goldstone London, United Kingdom

Background: Obesity and fasting may alter food hedonics and brain reward systems. Brain activity in the resting state (in absence of a task) may also be functionally important. Identified resting state networks include a salience network (SALN) involving insula, ventral anterior cingulate (vACC) and orbitofrontal (OFC) cortex, regions also activated by food cues. We hypothesised that the SALN is altered in obesity and by feeding state. Methods: 83 adults (64% male, mean ± SD age 33.2 ± 10.7y, BMI 19.1-53.1 kg/m², 29 lean, 28 overweight, 26 obese) had 10min resting state fMRI after an overnight fast. 22 of the non-obese subjects (17 male) re-attended twice, remaining fasted or receiving a 730kCal breakfast, and 85min later had resting state fMRI followed by task fMRI while rating the appeal of food pictures. Results: Obesity was associated with increased resting SALN integrity including OFC, vACC and insula ($P<0.05$), but not as a control the motor-sensor network and the sub-koohort; there was no significant effect of fasting on SALN integrity ($P=0.70$–$0.75$ vs. fed). When fasted, resting SALN integrity in the OFC was positively correlated with task OFC activation to high-calorie foods ($r=+0.52, P<0.02$), but this was not significant to low-calorie foods or when fed ($P=0.2$–$0.8$). Conclusions: The salience network at rest may encode aspects of food reward given the acute and chronic influences of nutritional state.

T-712-P
A Chromosome 15q11.2 Microdeletion Involving SNORD116 with Hyperphagia, Childhood-Onset Morbid Obesity and Hypogonadotropic Hypogonadism but without Short Stature, GH Deficiency or Mental Retardation Anthony P. Goldstone London, United Kingdom; Catherine Mitchell Uxbridge, United Kingdom; Stephen Mountford, Susan E. Holder, Debbie Papadopoulos, Nicola Bridges, Alexandra I. Blakemore, Beverley Bewes London, United Kingdom

Background: Three previous cases of childhood-onset obesity, hyperphagia, male hypogonadism/hypogonitalism and mild-moderate mental retardation with microdeletions of the paternally-inherited chromosome 15q11.2 involving a limited number of Prader-Willis syndrome (PWS) region genes have implicated the snRNAs, particularly SNORD116, in these phenotypes. Methods: A 24 year old man with morbid obesity and OSA was referred to our PWS clinic. Height was 1.82m (mid-parental height 1.86m), weight 188 kg, BMI 57.2 kg/m². He had a neonatal weak cry but no history of infantile hypotonia, feeding difficulties, delay in developmental milestones or mental retardation. He developed obesity from age 4y and binge eating episodes between 7-14y, but hyperphagia attenuated from his late teens. He had undescended testes and a unilateral orchidectomy aged 14y. He had micropenis and scrotal hypoplasia with no palpable testes. Results: Tests revealed hypogonadotropic hypogonadism but otherwise normal pituitary function including dynamic GH testing, normal blood pressure, lipids and glucose tolerance but fasting hyperinsulinaemia. MRI brain/pituitary was normal. X-ray revealed thoracolumbar scoliosis. WAIS neuropsychometric testing was normal (full scale IQ 104). SNRPN methylation-specific PCR was normal but array CGH demonstrated a 218kb chromosome 15q11.2 deletion. The microdeletion was not present in parental DNA samples. This deletion is predicted to include SNORD 109A/B, all copies of SNORD116 and copies 1-22 of SNORD115 clusters. Conclusions: This case further supports a role for these snRNAs, particularly SNORD116, in the regulation of eating behaviour and hypothalamic-pituitary-testicular development. Such microdeletions should be sought in childhood-onset obesity with hypogonadism even in the absence of short stature, mental retardation and other PWS phenotypes.

T-713-P
Adipokine and Cytokine Correlates of Neural Activation to High-Calorie Food Images in Obese Endometrial Cancer Survivors Nora L. Nock, Anastasia Dimitropoulos, Jean Tchak, Heidi Frasure, Vivian von Grunen Cleveland, OH

Background: Obese endometrial cancer (EC) survivors have a 3- to 6-fold increased risk of death compared to normal weight EC survivors. Adipokines and inflammatory cytokines may play a role in obesity related EC mortality. Leptin, which helps regulate food intake and energy expenditure, has been shown to stimulate EC cell growth and, TNF-α can disrupt insulin signaling and lead to aberrant EC cell growth. We previously reported that obese EC survivors had increased activation in response to high-calorie food images in brain regions associated with food reward and motivation, which were markedly reduced after a 6-month lifestyle intervention (Survivors in Uterine Cancer Empowered by Exercise and a Healthy Diet, SUCCEED). Methods: Here, we measured circulating levels of adipokines and cytokines at baseline and 6-months after the SUCCEED intervention and, examined potential correlations between these markers and neural activations to high-calorie food images in obese, early stage EC survivors ($n=8$). Results: We found that TNF-α was significantly reduced (Baseline: B: 3.19 ± 0.30 pg/ml; End of Intervention, EOI: 2.67 ± 0.61, p=0.01) and leptin (B: 29.34 ± 19.38 ng/ml; EOI: 24.17 ± 14.64, p=0.07) was marginally reduced after the intervention. We observed significant correlations between markers and differential post-meal activations at baseline including correlations between changes in leptin and increased precuneus activation ($p=0.75, p<0.05$) and between changes in TNF-α and increased posterior cingulate activation ($p=0.81, p=0.02$). Conclusions: Our results suggest that higher baseline activation in food reward and motivation regions may help predict EC survivors with smaller intervention-related improvements in adipokines and cytokines, which could ultimately affect their survival. Larger, longer-term studies are needed to confirm our preliminary findings.

T-714-P
Understanding Role of Anorexigenic Proopiomelanocortin Neurons in the Arcuate Nucleus of Hypothalamus Responding to Leptin Using Manganese Enhanced Magnetic Resonance Imaging Atsuo Yulvan, Weiping Han, Kao-Hsiung Chuang Singapore, Singapore

Background: Obesity is a great concern in the world that signified with leptin resistance. Regulation of energy homeostasis is dependent on central and peripheral signals in the hypothalamus. There are two main subpopulations of neurons responding to leptin: anorexigenic proopiomelanocortin/cocaine and amphetamine-related transcript (POMC/CART) and orexigenic neuropeptide Y/agouti-related peptide (NPY/AgRP) neurons in the arcuate nucleus (ARC) of hypothalamus. Understanding their interactions is a first step to determine the function of energy homeostasis. Methods: We used Manganese Enhanced...
Magnetic Resonance Imaging (MEMRI) to study the POMC neural function in vivo. Two sets of experiments were performed on C57BL/6 and POMC/STAT3 knockout (KO) mice. Groups: non-fasted, fasted, non-fasted and fasted injected with leptin. Results: We compared MEMRI signal intensity (SI) time-course in ARC in fasted vs non-fasted C57BL/6 mice. Consistent with literature, we saw increase of SI in fasted (4.4±3.0% vs non-fasted (2.9±0.2%) condition, which suggests firing of NPY/AgRP neurons. Under leptin infusion, decrease SI in fasted (3.3±0.2%) while increase in non-fasted (3.6±0.0%) condition suggests work of POMC/CART neurons. The smaller change under leptin implicates that orexigenic and anorexigenic neurons may be uneven with the NPY/AgRP stronger than POMC/CART. In POMC/STAT3 KO SI in the wild-type are similar to the C57BL/6 mice while in KO non-fasted injected with leptin has rise of SI. Conclusions: Observed changes in SI under different physiological conditions and leptin infusion suggest activation of AgRP neurons without inhibition from POMC or stronger activity of AgRP neurons. Further analysis of other nuclei can help to understand overall picture of leptin signaling neuronal pathway and fill up missing gaps about orexigenic vs anorexigenic neuronal interaction.

T-715-P
Brown Adipose Tissue Thermogenesis Is Time-Dependently Downregulated by Olanzapine in Rats
Qingsheng Zhang, Chao Deng, Meng He, Jamei Lian, Hongqin Wang, Xu-Feng Huang Wong, Australia

Background: Obesity is twice as prevalent in schizophrenia as the general population. Olanzapine, widely used to treat schizophrenia, is associated with increased metabolic risks including body weight gain, in which reduced energy expenditure is a major contributor especially in the late stages. The sympathetic neuronal circuitry, involving the actions of tyrosine hydroxylase (TH), is responsible for brown adipose tissue (BAT) thermogenesis and hence energy expenditure. However, the effect of olanzapine on sympathetic neuronal circuitry related to BAT thermogenesis has not been investigated.

Methods: Rats were treated with olanzapine (1mg/kg, orally, 3x/day, n=12/group) or vehicle for 1 week, 2 weeks, or 5 weeks. BAT temperature was measured by an implant microchip. Postmortem brain and BAT samples were collected for measurement of hypothalamic and brainstem TH mRNA (real-time PCR) and BAT uncoupling protein 1 (UCP1) and peroxisome proliferator-activated receptor gamma coactivator 1α (PGC-1α) protein levels (Westemblot) (n=6/group). Results: BAT temperature was reduced by olanzapine treatment from Day 18 during the light phase (P < 0.05). Consistently, UCP1 and PGC-1α expressions at BAT were reduced in the 5-week olanzapine treatment group compared to control (~30% and ~27%, respectively, both P < 0.01). Interestingly, mRNA expressions of TH in both hypothalamus and brainstem were also decreased at the 5-week olanzapine treated rats (~31% and ~35%, respectively, both P < 0.05). Conclusions: Olanzapine downregulates mRNA expressions of TH at hypothalamus and brainstem in a time-dependent manner, which may be the cause of the reduction of UCP1 and PGC-1α protein expressions at BAT, contributing to the time-dependent reduction of BAT thermogenesis.

T-716-P
MRI Detects the Development and Reversal of Hypothalamic Gliosis in Mice with Diet-Induced Obesity
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Background: High-fat diet (HFD) feeding in mice is associated with inflammation and gliosis in the mediobasal hypothalamus (MBH) that can be quantified in vivo using magnetic resonance imaging (MRI), but the rate of progression and reversibility of these findings are unknown. Methods: C57BL/6 male mice (n=8/group) were fed HFD for 20 wk, chow for 20 wk, or HFD for 16 wk then chow for 4 wk (reversal). MRI and body composition measurements were performed at baseline and after 1, 16 and 20 weeks on diet. To quantify gliosis by MRI, T2 relaxation time was measured in the MBH and in control regions (thalamus and cortex). Results: At 16 wk, HFD mice were heavier than Chow mice (mean 32.7±g vs 26.1±g, P<0.01). At 20 wk (following 4 wk of chow), the mean weight of the reversal group approached that of the chow group (27.9±g vs 26.0±g, P<0.01). There was no effect of diet on MBH T2 relaxation time (P>0.1) or 16 weeks (P>0.24). There was a significant effect of time (P<0.01) for mice on HFD; mean MBH T2 relaxation time at 20 wk was higher than baseline (20 wk-31.8±ms, SD 0.77 vs baseline-30.5±ms, SD 0.76; P<0.02). Between wk 16 and 20, T2 relaxation time in the MBH tended to increase in the HFD group (+0.96 ms) while decreasing in the reversal group (-0.38 ms) (P=0.12). Decreases in MBH T2 relaxation time correlated with decreases in percent body fat during diet reversal from 16 to 20 wk (P<0.04, R2=0.19). Conclusions: Quantitative MRI is useful to detect chronic gliosis in the MBH of mice with diet-induced obesity and to document reversal of these changes with switch back to chow. These results support the continued development and application of quantitative MRI in the study of hypothalamic gliosis in animal models and the pursuit of translational studies applying this technology in humans.

T-717-P
PPAR Gamma Delition in POMC Neurons Protects Again High Fat Diet-Induced Obesity
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Background: We have previously shown that high fat diet (HFD) feeding induced peroxisome proliferation via PPARg activation in the arcuate nucleus melanocortin system. Pharmacological inhibition of this mechanism diminished leptin resistance in diet-induce obese mice by affecting reactive oxygen species (ROS) levels in POMC neurons. Methods: We got the specific PPARg-POMC KO mice by cre-loxP system. Results: Here we show that selective deletion of PPAR gamma in POMC neurons protects against obesity during HFD feeding. Mice with PPARg deletion in POMC neurons had significant lower body weight gain compared to control mice on HFD due to a significant reduction in fat mass. Expenditure and locomotor activities were elevated while food intake was reduced. In agreement with an improved metabolic phenotype, glucose metabolism and insulin sensitivity were also significantly better in these mice compared to their controls. Analysis of ROS levels showed significantly greater elevations of ROS and decreased peroxisome density in POMC neurons of PPARg-POMC KO mice. In addition, PPARg-POMC KO mice showed increased leptin sensitivity revealed by increased suppression of feeding and elevated pSTAT3 levels in the POMC neurons. Conclusions: Altogether, our data support an important role for PPARg in POMC neurons for whole body adaptation to overnutrition mediated by ROS control.

T-718-P
The Hyperphagia in Synphilin-1 Overexpressing Mice Is Characterized by Increased Meal Size
Wanli Smith, Xueping Li, Yada Treessukosol, Alexander Moghadam, Dejun Yang, Megan Smith, Erica Ofeldt, Pil Choi, Kellie Tamashiro, Timothy Moran Baltimore, MD

Background: Synphilin-1 is a cytoplasmic protein that has been shown to be involved in energy balance control. We recently generated a human synphilin-1 transgenic mouse model (SP-1), in which overexpression of human synphilin-1resulted in hyperphagia and obesity. Methods: To further characterize the synphilin-1-induced hyperphagia, meal patterns of synphilin-1 mice were observed. Results: The results showed that synphilin-1 overexpression resulted in increased meal size without a change in meal number. Increased meal size may be mediated by increased positive signals such as those arising from the oral cavity. To assess whether SP-1 mice had altered orosensory responsivity, we tested SP-1 and control mice in a brief access test. This taste procedure is designed to present various taste solutions in short (5-s) trials across one session and thus to minimize the effect of postdigestive cues. Concentration-dependent licking responses were assessed in 6-week (“pre obese”) and 4-month old (“obese”) SP-1 mice and controls to a concentration array of sucrose. SP-1 mice displayed concentration-dependent licking across the sucrose concentration range tested similar to their non-transgenic controls. However, at 6-week of age, SP-1 mice initiated significantly more trials to sucrose across the testing sessions and licked more vigorously to the highest concentration presented, compared to non-transgenic controls. These group differences in responsiveness to sucrose were not apparent in obese SP-1 mice. Conclusions: These findings suggest that the hyperphagia observed in SP-1 mice is due to increases of meal size that may be partially mediated by an increased appetitive behavioral component to palatable foods. However, these changes are not likely attributed to robust alterations in taste responsiveness to preferred stimuli.
T-719-P  
Isolated Nuclei for the Cell-Type Specific Analysis of Neurons and Adipocytes  
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Background: Epigenetic reprogramming of diverse neurons in the hippocampus and hypothalamus and other parts of the brain appear to control aberrant eating behavior, hunger, and satiety, while reprogramming of adipocytes in visceral and subcutaneous adipose tissue (VAT, SAT) likely controls the inappropriate secretion of adipokines. However, the cell-type specific epigenetic reprogramming of neurons in the brain or adipose tissue is essentially unexplored due to the technical difficulty of isolating these fragile cell types. Neuronal and supportive glial cell types are highly interdigitated within brain tissues and adipocytes are very large and unstable relative to other cells within VAT or SAT. Methods: We are characterizing the nuclei from brain, VAT, and SAT to perform cell type specific analyses of these fragile cell types. The nuclei from all three are relatively easy to isolate. Results: Fluorescence Nuclear Cytometry (FNC) provided an initial characterization of populations of nuclei derived from mouse brain and porcine VAT and SAT. Using the pan-neuronal marker NeuN, we found NeuN-H (high) and NeuN-L (low) neuronal nuclei in young mouse brain were coordinately expressed with high and low levels of histone deacetylases HDAC2 and SIRT1, respectively. By contrast, the non-neuronal NeuN-mostly glial nuclei either expressed very low levels of HDAC2 and SIRT1 or were double negative. Two other novel techniques utilizing nuclei, Fluorescence Activated Nuclear Sorting (FANS) and Capture by Nuclear Antibody (CANA) were being developed to isolate biochemically useful quantities of nuclei from subpopulations. Conclusions: These new nuclear-based approaches, FNC, FANS, and CANA should enable cell-type specific epigenetic and proteomic analyses of fragile cell types of interest to obesity research.

T-720-P  
Translating tDCS Into the Field of Obesity: Using Computational Models to Guide Parameters and Protocols in Clinical Trials  
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Boston, MA

Background: Transcranial direct current stimulation (tDCS) is a noninvasive brain modulation technique with emerging applications in a variety of clinical conditions. Recent neuroimaging studies link obesity with an imbalance in brain circuits involved in reward and cognitive aspects of food intake. Manipulating brain activity via tDCS can help rebalance these circuits and thus provide therapeutic benefits in obesity. Optimal tDCS parameters and protocols in this condition have not been defined yet. Methods: We used MRI-derived high-resolution computational models that delineated six brain tissues (air, skin, skull, cerebral spinal fluid, gray matter, and white matter) plus subcutaneous fat in five human heads from subjects with BMI 20.9-53.5 kg/m². First we examined the effect of BMI on tDCS current density distribution. Second, we dilated the fat tissue on two lean heads to determine if fat tissue layer thickness and peak current intensity. We found that the relative tissue distribution and peak current intensity changed with BMI. Lastly, we simulated high-definition tDCS (HD-tDCS) montages to test the most optimal combination of sources to reach the following targets of interest: hypothalamus, nucleus accumbens, insula and several sectors of the prefrontal cortex. Results: We observed no association between BMI or any tissue layer thickness and peak current intensity. We found that the relative influence of head fat represents only a small fraction of the variability accounted for by head anatomy as a whole. The contribution of head fat does not seem to be a major issue to prompt a general adjustment of dose. We are currently conducting a clinical trial with tDCS in obese patients following laparoscopic adjustable gastric banding. Conclusions: tDCS is a promising neuromodulatory technique in obesity. Computational models can inform and guide future clinical trials in this field.

T-721-P  
Human Visceral Adipose Tissue Conditioned Media Protects Against H2O2 Induced Neurotoxicity in Human SH-SY5Y Cells  
Zhongxiao Wan, Dorrian Mah, Svetlana Simitchouk, Andreas M. Klufinger, Jonathan P. Little  
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Background: Adipose tissue is recognized as an endocrine organ, releasing factors that could potentially damage (e.g., tumor necrosis factor [TNF]-α) or protect (e.g., nerve growth factor [NGF]) neurons. The concept of adipose-brain crosstalk is supported by widespread expression of adipokine receptors in the central nervous system. The aim of this study was to 1) explore the effects of human adipose tissue secreted factors on oxidative stress-induced toxicity in human SH-SY5Y neuroblastoma cells, and 2) determine whether adipose tissue depot-specific effects existed. Methods: Preperitoneal adipose tissue samples were obtained from 8 female subjects [age 52 ± 6 yr, body mass index (BMI) 24.1 ± 1.1 kg/m²] and subcutaneous adipose tissue samples were obtained from 4 female subjects (age 47 ± 3 yr, BMI 30.3 ± 2.0 kg/m²) undergoing abdominal surgeries. Adipose tissue organ cultures were maintained for 24 hr and adipose tissue conditioned media (ATCM) was collected and transferred to SH-SY5Y neuronal cells. Following a 2 hr pre-incubation, SH-SY5Y cells were challenged with H2O2 (800 μM) and MTT assay was performed to assess cell viability after 48 hr. Results: H2O2 killed ~70% of neuronal cells; ATCM from the preperitoneal depot completely rescued oxidative stress-induced neurotoxicity while media from subcutaneous depot had no such effect. Heating preperitoneal ATCM (95°C for 10 min) abolished its neuroprotective effects. Conclusions: It is concluded that heat-sensitive factors secreted from human visceral adipose tissue can protect against H2O2 induced toxicity in SH-SY5Y neuronal cells. Further studies are warranted to 1) identify the putative neuroprotective factors; 2) determine whether factors secreted by adipose tissue are protective against other neurotoxins; and 3) explore what is causing the apparent depot specific effects.

T-722-P  
Reduced Evoked Neural Activity in the Locus Coeruleus of Female Rats Exposed to Dietary-Induced Binge Eating  
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Background: Stress is often associated with binge eating. Previous investigations into this relationship have focused on the hypothalamic-pituitary-adrenal (HPA) axis. These experiments sought to examine how dietary-induced binge eating influences the neuronal activity of the locus coeruleus (LC)-noradrenaline system. Methods: Young female Sprague Dawley rats were exposed to a repeated intermittent cycle of 24 h food deprivation followed by 30 min access to a highly palatable sweet-fat food (restrict-binge). Age- and weight-matched female control rats were exposed to standard chow feeding (naïve). On week 3, in vivo single unit LC electrophysiological activity was recorded under isoflurane anesthesia. Spontaneous neural activity was recorded for 3 min, followed by sensory-evoked activity during a trial of sciatic nerve stimulation (50 stimuli, 3 mA, 0.5 ms duration, 0.2 Hz). Results: Restrict-binge rats (20 cells, 6 rats) had significantly (t = -2.62, p < 0.05) reduced evoked LC discharge rates compared with naïve rats (22 cells, 7 rats) (11.6 ± 0.5 vs. 14.4 ± 0.8 Hz). Spontaneous and tonic discharge rates were not different between the two groups. Components of the averaged peristimulus time histogram revealed differences in the biphasic LC neuronal profile between groups. Restrict-binge rats had a blunted evoked phase (20-124 ms post-stimulus)[F(4,49,1960) = 1.4, p = 0.005]. Conclusions: Such data suggest that dietary-induced binge eating alters the neural response of LC neurons to sensory stimuli. This research furthers our understanding of how highly palatable foods and dietary conditions dampen the neural stress axis.

T-723-P  
Eating-Associated Hippocampal Expression of the Synaptic Plasticity Marker Arc Correlates with the Duration of the Postprandial Interval and is Diminished in Rats with Poor Hippocampal-Dependent Spatial Memory  
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Background: We hypothesize that hippocampal neurons form a memory of a meal and temporarily suppress meal onset during the postprandial intermeal...
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For author conflict of interest information, see page S264

Poster Abstracts – Wednesday, November 13 to Friday, November 15, 2013

T-724-P
Enhanced Chemotherapy-Induced Neuronal Activation in Obese Rats
Ruby A. Holland, John A. Leonard, Bart C. De Jonghe Philadelphia, PA

Background: The medical impacts of obesity and cancer have never been greater. To cure cancer, it is critical that patients follow prescribed chemotherapy without interruption, even in the face of severe side effects [e.g. nausea, vomiting, severe appetite suppression and weight loss]. It is surprising that given the enormous risk of obesity with many cancers, the potential role of obesity on chemotherapy-induced activation of neuronal areas implicated in mediating chemotherapy-induced nausea is virtually unexplored.

Methods: We hypothesized that obesity would exacerbate cisplatin chemotherapy-induced nausea and neuronal activation in areas implicated in the control of chemotherapy-induced emesis and energy balance dysregulation. Rats were maintained on chow or high fat diet for 12 weeks. Following this period, separate groups were injected with doses of cisplatin based on total or “ideal” body weight and sacrificed at 6 and 48 h in order to examine acute and delayed phases of cisplatin-induced sickness. Results: Cisplatin-induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were induced neuronal activation in the parabranch...
suggests that increased food consumption may be driven by alcohol’s effects on a behavioral inhibition pathway.

T-728-P
Abnormal Brain Reactivity to a Glucose Challenge in Insulin Resistant Polycystic Ovary Syndrome Patients

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Background: Insulin signals acute and chronic positive energy balance. We postulate that insulin resistance may lead to impaired insulin signaling in the brain. We tested our hypothesis in a cohort of polycystic ovary syndrome (PCOS) patients because there is a high incidence of insulin resistance in this condition. Methods: Nineteen women diagnosed with PCOS were recruited to the study. Subjects underwent functional magnetic resonance imaging on two occasions while viewing pictures of high calorie (HC) or low calorie (LC) foods 15 minutes after ingesting either 75 grams dextrose or an equivalent volume of water. Blood oxygen level dependent (BOLD) response to visual food cues was determined during water or dextrose ingestion. An effect of insulin sensitivity on brain responsiveness was examined by including homeostasis model assessment 2-insulin resistance (HOMA2-IR) as a regressor. Body mass index (BMI) was included as a nuisance covariate in order to control for potential effects of adiposity. Results: A positive correlation between HOMA2-IR and activation in the medial prefrontal cortex, anterior cingulate, insula, and cingulate gyrus was observed in response to both HC and LC foods in the inferior orbitofrontal cortex, amygdala/hippocampus, and midbrain in response to the HC-LC contrast following dextrose ingestion. No association between and insulin resistance and BOLD response was observed when subjects were imaged after drinking water. Conclusions: The correlation between HOMA2-IR and BOLD response to visual food cues during a glucose challenge may reflect an impaired brain response to a glucose challenge in subjects who are insulin resistant. The inability of postprandial hyperinsulinemia to inhibit brain responsiveness to food cues may result in continued eating despite the presence of positive energy balance signals.

T-729-P
Hypothalamic fMRI Responses to Different Sugars Under Normal Intake Conditions: A Pilot Study

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Background: It is known that neuronal activity in the hypothalamus changes according to glucose levels, but there is limited data for the case of other sugars. Recent human neuroimaging studies suggest that ingestion of fructose can cause a relative reduction of hypothalamic activity in comparison with glucose (Page et al., 2013). Such decrease in hypothalamic activity may reveal differences in satiety sensation. The relevance of these findings is uncertain, as the amount and type of sugar used in these investigations did not represent daily consumption levels or patterns. The aim of this pilot study was to examine hypothalamic activity to different sugars under normal conditions of intake. Methods: Seven healthy young volunteers underwent a randomized, crossover, double-blinded fMRI study under five different conditions (separate days): 9% of energy of fructose or glucose, 18% of energy of high-fructose corn syrup or sucrose and regular 1% milk. The protocol consisted of 6 runs of resting-fMRI. During the first two runs subjects were in the fasting state. Subsequently they ate a standardized meal outside the scanner that included the specific sugar condition administered in a liquid formula. After the meal (30 minutes), subjects were scanned four additional runs. Data analysis, standard image preprocessing was performed using FSL software. A seed of 4 mm was placed in the hypothalamus based on a previous study (Page et al., 2013) to compute the percent signal change. Results: In this pilot study mimicking the conditions of a regular meal, we did not find any significant differences in hypothalamic activity between the five sugar conditions. Conclusions: Although these results should be considered preliminary, they suggest that the previously identified differences may not occur under conditions that are more representative of normal daily intake levels and patterns.

T-730-P
Dexamethasone Induced Anorexia and Decreased Sweet Preference

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Background: This study investigated if dexamethasone-induced suppression of food intake and weight gain is accompanied with decreased sweet preference. Anhedonia, a core symptom of depression, can be assessed in rats by measuring sweet preference. Methods: Rats received daily injections of dexamethasone (0.1 or 1 mg/kg) or saline. Food intake and weight gain were recorded daily, and preferences to sucrose solution measured weekly. Rats were subjected to ambulatory activity and forced swim tests after 2 days or 4 weeks of daily drug injections. Results: Food intake and weight gain was suppressed by daily dexamethasone in a dose dependent manner. Decreased sweet preference was observed after 2 and 3 weeks of drug treatment. Depression- and anxiety-like behaviors were observed after 3 weeks, but not 3 days, of drug treatment. Sweet receptor, T1R2 and T1R3, expression in the circumventrulate papillae was not significantly affected by dexamethasone treatment. Conclusions: These results suggest that not only dexamethasone-induced anorexia but also anhedonia may not comprise decreased sweet perception, and that decreased weight gain and food intake may at least partially contribute to the psycho-emotional outcome of dexamethasone treatment.

T-731-P
Working Memory and Attention on Reinforcing Efficacy of High Energy Dense Foods in Women

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Background: Choices between different types of foods, healthy or low energy-dense (LED), and unhealthy or high energy dense (HED), can lead to differences in energy intake over time. One aspect of food choices is the reinforcing efficacy of different foods, or how much money one is willing to spend for a portion of food. Individual differences in choices and reinforcing efficacy of food may be related to a variety of higher order cognitive functions, including working memory and attention. Working memory is related to decision-making and to self-regulatory behaviors, while attentional bias to food versus non-food is predictive of BMI and weight change over time. Individuals who direct attention towards food may also have trouble disengaging from food cues, in addition to being unable to assess alternative options if combined with low working memory. Methods: A study of 48 adult women measured working memory (operational span task), attention to food (dot-probe) and reinforcing efficacy of HED and LED foods. Results: A significant interaction between working memory and attention bias for HED foods was found for HED breakpoint or the maximum amount of money one was willing to spend on an HED snack food (p = 0.01). The simple slopes revealed that attention to foods did not influence maximum spending for HED foods in individuals with low working memory. Individuals with high working memory showed a significant effect of attention such that those with a low attentional bias for HED foods were not willing to spend as much on HED snack foods as individuals with a high attentional bias for those foods. Conclusions: These results show that both working memory and attention to food are involved in food choice.

T-732-P
Increased Intravenous Morphine Self-Administration and Altered Opioid Receptor Modulation of Sucrose Reward Following Roux-en-Y Gastric Bypass in Dietary Obese Rats

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Background: Roux-en-Y gastric bypass (RYGB) is the most successful therapy for obesity and associated comorbidities. One potential adverse outcome, however, is increased risk for drug use. Previously, we found increased motivation to seek and consume alcohol in outbred high fat-diet-induced obese (HF-DIO) rats following RYGB (Thanos et al. 2012, Hajnal et al., 2012). In the present study, we tested whether RYGB also alters motivation to intravenously self-administer (IVSA) morphine, and investigated the effects of the non-selective opioid receptor antagonist naltrexone on sucrose self-administration. Methods: HF-DIO male rats received RYGB (n=6) or sham-
T-733-P Disruption of Promoter I but Not Promoters IV or VI of Brain-Derived Neurotrophic Factor (BDNF) Is Associated with Obesity
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Background: BDNF appears to function downstream of leptin signaling to control energy balance. BDNF expression is driven by multiple promoters, but their individual roles in energy regulation remain to be elucidated. Methods: We studied C57BL/6J male mice in which promoters I (Bdnf-I-/-), IV (Bdnf-IV-/-), or VI (Bdnf-VI-/-) were disrupted by the insertion of a GFP-STOP cassette, resulting in preserved Bdnf RNA expression (confirmed by qRT-PCR in hypothalamus and hippocampus) but lack of BDNF protein translation from transcripts driven by the disrupted promoter. Mice were fed ad libitum regular chow diet from weaning and weighed weekly. Body composition (MRI and dissection), food intake, physical activity (PA, beam breaks), energy expenditure (EE, indirect calorimetry), and glucose and insulin tolerance tests were assessed. ANCOVAs adjusted for lean mass and percent body fat. Results: Bdnf-I-/- and Bdnf-I-/- mice had body weights similar to wild-type (WT) littersmates. In contrast, Bdnf-I-/- mice had higher body weights compared to WT by 12 weeks (mean ± SEM, Bdnf-I-/- vs. WT: 33.8 ± 1.4 vs. 28.5 ± 0.6 g, p=0.009), which was more pronounced at 6 months (Bdnf-I-/- vs. WT: 43.2 ± 0.8 g, p<0.0001) and associated with higher percent body fat (30.7 ± 1.2 vs. 16.0 ± 1.1%, p<0.0001), greater food intake but similar body composition-adjusted food intake, lower adjusted resting EE at 30°C, higher adjusted PA, and similar adjusted total EE compared to WT. Bdnf-I-/- mice had hyperinsulinemia, insulin resistance, and enlarged fatty livers. Conclusions: Disruption of Bdnf promoter I resulted in 50% greater body weight and 2-fold higher percent fat at 6 months, whereas disruption of promoters IV or VI had no significant effect on body weight. Our findings suggest that Bdnf promoter I, but not promoters IV or VI, plays a critical role in regulating energy balance.

T-734-P The Relationship between Cognitive Control and Measures of Physical Fitness and Body Composition in Hispanic Elementary School Children
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Background: Many studies have shown that aerobically fit children perform better than their less fit peers on cognitive control tasks. However, most of the research has focused on aerobic fitness and not general physical fitness measures. Fewer studies have examined the relationship between fitness and cognitive control accounting for body composition. Furthermore, no studies have examined these relationships in an exclusively Hispanic population. Methods: The purpose of this study was to determine whether cognitive control varied in relation to a battery of physical fitness and body composition measures in a group of 29 elementary school, Hispanic children (mean age: 8.5 years). Participants performed a flanker task to measure cognitive control and several physical fitness tests including: 2-minute walk, vertical jump, 1-minute curl-up, and right-left handgrip strength test. Body composition measures included: body mass index, percent body fat, waist circumference, and sagittal height. A multiple regression analysis was used to predict variation in flanker task reaction time by physical fitness and body composition measures after controlling for gender and age. Results: Children who performed better on the 2-minute walk test had faster reaction times on the flanker task (r=0.79, p<0.01). There were no statistically significant differences found between the flanker task and other physical fitness and body composition measures. Conclusions: Our findings support the positive relationship between aerobic fitness and cognitive control in elementary school Hispanic children, independent of other measures of physical fitness or body composition.

T-735-P Differences between Adherers and Non-Adherers to an Exercise Program During a Delay Discounting Paradigm
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Background: Increasing compliance with exercise programs has been a major hurdle in weight management and increasing positive health outcomes. Unfortunately, little is known about the underlying neural and behavioral mechanisms that lead to success in exercise adherence. Methods: This ongoing study followed obese and healthy weight adult participants (N = 26) over the course of a 9-month exercise program (75% maximal heart rate; 50 minutes/session; 5 days/week). Before beginning exercise, each participant completed a Delay Discounting Paradigm during fMRI. The Delay Discounting Paradigm involves choosing between receiving immediate but smaller, or larger but delayed, financial rewards. At the 9-month time point, each participant was classified as an Adherer or Non-adherer. Adherence is defined as a 80% of 250 minutes a week at the participant’s target heart rate (≥4 BPM). Whole brain GLM was conducted for each subject using AFNI’s 3DDeconvolve program. Regression coefficients for immediate and delayed choices were averaged for Adherers and Non-adherers and compared using AFNI’s 3dtest++. Results: Several significant (p < 0.01, FWE corrected) interactions in a priori regions were found. When making both immediate and delayed choices, Non-adherers showed increased activation in the hippocampus (x: y: z: = 26,14,14 and cingulate (x: y: z: = -6, -48, 6) compared to Adherers. When making immediate choices, Non-adherers showed greater activation in the striatum (x: y: z: = 26,4,11). Conclusions: These brain regions are a part of motivational networks implicated in reward processing, and results are consistent with increased sensitivity to immediate reward. This impulsive style of decision-making can lead to discounting the delayed benefits of exercise making it difficult to continue in the face of more immediately rewarding choices. Support: R01DK058650, Hoglund Brain Imaging Center.

T-736-P Identifying structural Brain-Based Differences in Obese Adolescents with and without Type 2 Diabetes (T2D)
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Background: Type II diabetes mellitus (T2DM) is associated with reduced cognitive performance on measures of executive function, inhibitory control, and impulsivity. These performance deficits have been hypothesized to be related to differences in brain networks, including gray matter volume and white matter integrity. Thus, we predicted that adolescents with T2DM would have smaller brain volumes and reduced white matter integrity compared to obese adolescents without T2DM. Methods: Five obese adolescents with T2DM, five obese adolescents without T2DM, and five normal weight adolescents participated in a Magnetic Resonance Imaging (MRI) pilot study and were matched on sociodemographic variables including race, age, and sex. Diffusion tensor imaging (DTI) was used to measure white matter integrity and an automated method was used to determine volume of the amygdala, stratum, and hippocampus from high-resolution anatomical images. Results: We found that adolescents with T2DM had smaller gray matter volumes in all regions except the amygdala when compared to either the obese group or normal control group. Adolescents with T2DM also had reduced integrity of corticostriatal white matter tracts from the lateral frontal cortex compared to the obese or normal weight groups. Conclusions: Our preliminary results suggest that T2DM and the metabolic changes associated with the disease may have damaging effects on brain health and integrity during a period of life when the brain is reaching its full potential.
T-737-P  
Icosapent Ethyl (Eicosapentaenoic Acid Ethyl Ester) Therapy in Hypertriglyceridemic Stable Statin-Treated Patients with Metabolic Syndrome: Effect on High-Sensitivity C-Reactive Protein Levels

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Background: Increased waist circumference and high triglyceride (TG) levels are diagnostic components of the metabolic syndrome (MetSyn), which is a collection of cardiovascular disease (CVD) risk factors. Increased adiposity may promote an increase in high-sensitivity C-reactive protein (hsCRP), which is also a CVD risk factor. Statins reduce hsCRP, but prior reports of eicosapentaenoic acid (EPA) combined with docosahexaenoic acid (DHA) on hsCRP are inconsistent. Icosapent ethyl (IPE; formerly AMR101) is a high-purity prescription form of EPA ethyl ester (EPA alone, without DHA) approved in the United States as an adjunct to diet to reduce TG levels in adult patients with severe (>500 mg/dL) hypertriglyceridemia. Methods: The ANCHOR study was a multicenter, placebo-controlled, double-blind, 12-week study of IPE in 702 randomized patients with statin-stable high-risk patients with TG >200 and <500 mg/dL and low-density lipoprotein (LDL) cholesterol >100 mg/dL on control. This analysis evaluated the IPE effects of IPE in a subset of patients from the ANCHOR study with MetSyn. Results: In the ANCHOR study, there were 645 patients with MetSyn in the intent-to-treat population. Compared to placebo, IPE 4 g/day significantly reduced TG (21.7%, p<0.0001), non-high-density lipoprotein cholesterol (13.5%, p<0.0001), apo B (8.8%, p<0.0001) and LDL-C (5.2%, p=0.0236). IPE 4 g/day also reduced hsCRP levels by 23.6% (p=0.0003) compared to placebo. Conclusions: Compared to placebo in hypertriglyceridemic patients with MetSyn, IPE 4 g/day improved lipid levels and reduced hsCRP; these effects were in addition to stable statin therapy.

T-738-P  
Effects of Lorcaserin on Lean and Fat Mass Loss in Patients with T-2 Diabetes Mellitus from the BLOOM-DM Study of Obese and Overweight Patients

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Background: Lorcaserin (LOR), a selective serotonin 2C receptor agonist, is approved in the US for chronic weight management as an adjunct to a reduced-calorie diet and increased exercise (DE) in obese and overweight patients (pts), with ≥5% weight loss. We report the total weight loss and loss of fat and lean body mass over 1 year (y) as determined by dual-emission X-ray absorptiometry (DXA) in a randomized subset of pts from BLOOM-DM, Methods: Together with DE, 604 obese and overweight adults with type 2 diabetes (T2DM) and baseline HbA1c of ≥7.0% were randomized to LOR 10 mg once daily (qd), LOR 10 mg twice daily (bid), or placebo (PBO). DXA scans were done at baseline, 3, 6 months, and 1 y in 63 patients. Body fat and lean mass were stratified by baseline HbA1c. Results: The decrease in weight from baseline at 1 y was 4.7 kg or 4.5% (LOR bid, n=251), 5.0 kg or 5.0% (LOR qd, n=94), and 1.6 kg or 1.5% (PBO, n=248). In the DXA population at 1 y, the decrease in fat mass from baseline was 4.3 kg (LOR bid, n=18), 4.6 kg (LOR qd, n=22), and 1.4 kg (PBO, n=23), while the decrease in lean mass was 1.8 kg, 1.7 kg, and 2.0 kg, respectively. For pts with baseline HbA1c <9%, the fat mass loss was 2.6 kg (LOR bid, n=15), 3.7 kg (LOR qd, n=18), 1.4 kg (PBO, n=17) vs 9.1 kg (n=3), 5.0 kg (n=4), and 0.2 kg (n=6), in pts with baseline HbA1c ≥9%. The lean mass loss in pts with baseline HbA1c <9% was 0.8 kg (LOR bid, 1.3 kg (LOR qd), and 2.1 kg (PBO) vs 4.8 kg, 1.8 kg, and 1.0 kg, for baseline HbA1c ≥9%. Conclusions: Fat-mass loss was significantly greater with LOR+DE than PBO+DE while lean-mass loss with LOR+DE was comparable (0.2 kg-0.3 kg lower) to that of PBO+DE in pts with T2DM. Although the populations were too small for definitive conclusions, loss of fat mass appeared greater in pts with baseline HbA1c ≥9% than in pts with lower initial HbA1c. aP<0.0001 vs PBO. bP<0.05 vs PBO.

T-739-P  
Effects of Lorcaserin on Lean and Fat Mass Loss in the BLOSSOM Study of Obese and Overweight Patients

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Background: Lorcaserin (LOR) is a selective serotonin 2C receptor agonist for weight management. Lean and fat body mass tends to be greater in overweight and obese than normal weight patients (pts). We report fat and lean body mass loss relative to overall weight loss achieved over 1 yr as determined by dual-emission X-ray absorptiometry (DXA) in a randomized subset of pts from BLOSSOM, a placebo (PBO)-controlled study of LOR efficacy and safety. Methods: Together with diet and exercise counseling (DE), obese and overweight adults were randomized to LOR 10 mg once daily (QD), LOR 10 mg twice daily (BID), or PBO. DXA scans were performed at baseline, 6 months, and 1 y. Body fat and lean mass loss were analyzed by sex and magnitude of weight loss. Results: DXA data was collected from 189 pts. In this group at week 52, the decrease in body fat mass from baseline was 9.9% (LOR QID, n=85), 6.1% (PBO QD, n=35), and 4.6% (PBO, n=69), while the decrease in lean mass was 1.9% (2.0%), and 0.3%, respectively. For females, the body fat mass decrease was 9.9% (LOR QD, n=77), 6.0% (LOR QD, n=31), and 3.4% (PBO, n=53) vs 10.4% (n=8), 6.6% (n=4), and 8.5% (n=16), respectively. The lean mass decrease in females was 2.0% (LOR QD), 2.1% (LOR QD), and 0.2% (PBO) vs 0.8%, 0.7%, and 0.6%, respectively, in males. In subjects with ≥5% weight loss at week 52, fat mass loss was 18.4% (LOR QID, n=47), 15.6% (LOR QD, n=15), and 13.8% (PBO, n=20), while lean mass loss was 3.2%, 3.9%, and 2.7%. Conclusions: LOR was associated with an overall reduction in fat body mass. Fat mass loss was greater with LOR BID+DE than PBO+DE, and most LOR-associated weight loss was fat mass. Our results suggest that the composition of weight loss with LOR favors fat vs lean mass loss. aP<0.05 vs PBO. bP<0.526 vs PBO. cP<0.020 vs PBO. dP<0.054 vs PBO.

T-740-P  
Early Achievement of Significant Weight Loss with Naltrexone/Bupropion Is Associated with Additional Weight Loss at One Year - An Integrated Analysis of Four Phase 3 Trials

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Background: Naltrexone sustained-release (SR) / bupropion SR (NB [32mg/360mg]) significantly reduced body weight vs. placebo (PBO) in four Phase 3 trials of overweight/obese subjects (BMI ≤32 kg/m²) at week 56: NB -7.0% (SE=0.2) body weight vs. PBO -2.3% (SE=0.2; p<0.0001). At week 16, non-high-density lipoprotein cholesterol (13.5%, p<0.0001), apo B (8.8%, p<0.0001) and LDL-C (5.2%, p=0.0236). IPE 4 g/day also reduced hsCRP levels by 23.0% (p=0.0003) compared to placebo. Conclusions: Compared to placebo in hypertriglyceridemic patients with MetSyn, IPE 4 g/day improved lipid levels and reduced hsCRP; these effects were in addition to stable statin therapy.

Conclusions: Fat-mass loss was significantly greater with LOR+DE than PBO+DE while lean-mass loss with LOR+DE was comparable (0.2 kg-0.3 kg lower) to that of PBO+DE in pts with T2DM. Although the populations were too small for definitive conclusions, loss of fat mass appeared greater in pts with baseline HbA1c ≥9% than in pts with lower initial HbA1c. aP<0.0001 vs PBO. bP<0.05 vs PBO.
T-741-P
Naltrexone/Bupropion Is Associated with Early and Longer-Term Improvement in Binge Eating Disorder That Is Related to Improvement in Depression
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Methods: An open-label, single-arm study of NB in overweight/obese subjects with MDD suggested that NB is associated with significant reductions in weight, depression scores, and binge eating (assessed using the Binge Eating Scale [BES]). This exploratory analysis assessed the time course of improvement in BES scores with NB, and the relationship between changes in depression (Inventory of Depressive Symptomatology–Self-Report [IDS-SR]) and BES scores. Results: Baseline characteristics (N=25) include: 100% female; age 47 y; BMI 35 kg/m²; BES score 28.4; IDS-SR score 43.2. 48% of subjects completed 24 weeks of NB treatment. BES was significantly reduced by -14.7 units (SD=9.5; p<0.001) at week 4 and remained significantly improved throughout the trial, with a -20.1 (SD=9.4) unit improvement at week 24 (p<0.001). In subjects who completed 24 weeks of treatment, baseline BES classification was either “severe” (75%) or “moderate” (25%), while at end-point (24 weeks) none were classified as “severe,” 18% as “moderate,” and 82% as no longer having binge eating problems. Changes in IDS-SR score was correlated with change in BES at each time point (r=0.59 to 0.70 at 6, 8, 12, and 24; all p<0.05). Conclusions: This exploratory analysis suggests that in subjects with MDD, binge eating behavior is rapidly improved with NB treatment and the improvement is related to improvement in MDD.

T-742-P
Number Needed to Treat Analysis (NNT) of Lorcaserin in Overweight and Obese Patients
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Methods: The BLOOM/BLOSSOM (N=7190) enrolled overweight (BMI 27-29.9) and obese subjects (BMI ≥ 30) and overweight (BMI ≥ 27 to ≤ 29.9) and obese subjects (BMI ≥ 30) without diabetes. BLOOM-DM (n=604) enrolled similar patients with diabetes. FDA recommended that patients not losing ≥5% of baseline body weight at 12 weeks should discontinue treatment to maximize benefit and avoid unnecessary exposure. Therefore, this NNT analysis evaluated 1-year endpoints including weight loss (WL), reduction in waist circumference (WRC), and change in HbA1C (BLOOM-DM only) in those who achieved ≥5% WL at 12 weeks (responders) and the lorcaserin overall population, in comparison to the placebo group. Results: 85.5% and 49.8% of BLOOM/BLOSSOM responders achieved at least 5% and 10% WL at 1 year. NNTs in responders for 5% WL, 10% WL, 10% RWC are 1.6, 2.4, 2.4, lower than the NNTs for the lorcanarin overall population (4.1, 7.3, and 6.8). 70.5% and 35.9% of BLOOM-DM responders achieved at least 5% and 10% WL at 1 year. NNTs for 5% WL, 10% WL, 10% RWC, and HbA1C ≥ 7% are 1.8, 3.2, 4.1, 2.2 in responders and 4.8, 8.4, 9.8, 3.9 in the lorcanarin overall population. Conclusions: This NNT analysis suggests that using ≥5% WL at 12 weeks as a criterion for discontinuation of lorcanarin can help physicians predict how many patients are likely to respond to therapy. This may increase the likelihood for success, avoid unnecessary risk, and ensure effective use of healthcare resource.

T-743-P
Effects of Phentermine and Topiramate Extended-Release (PHEN/TPM ER) Treatment on Weight Loss (WL) by Gender, Race and Ethnicity Over 1 Year
Donna H. Ryan Baton Rouge, LA; Santosh T. Varghese Mountain View, CA
Background: In obese/overweight individuals, gender, race, and ethnicity can affect the success of WL interventions. PHEN/TPM ER has induced significant WL in the EQUIP study of obese subjects (BMI ≥ 35 kg/m²) and in the CONQUER study of obese/overweight subjects (BMI ≥ 27 to ≥ 45 kg/m²) with ≥2 weight-related comorbidities. Methods: Data from these 2 double-blind, randomized Phase 3 studies were pooled. Subjects received placebo (PBO), PHEN 3.75 mg/TPM ER 23 mg (3.75/23), PHEN 7.5 mg/TPM ER 46 mg (7.5/46), or PHEN 15 mg/TPM ER 92 mg (15/92) and lifestyle modifications based on the LEARN program. WL at week 56 was assessed in responders (≥3% WL at week 12) stratified by gender, race (black and non-black), and ethnicity (Hispanic/Latino and non-Hispanic/Latino). Analysis was restricted to those with a week-12 measurement. Results: At week 12 in the overall population, 2033/3126 (65%) subjects had ≥3% WL: 34.7%, 59.2%, 82.5%, and 98.0% of the PBO, 3.75/23, 7.5/46, and 15/92 groups, respectively; similar response rates were seen in male, female, non-black, and non-Hispanic/Latino subjects. Responder rates for PBO, 3.75/23, 7.5/46, and 15/92, respectively, in black subjects were 26.5%, 51.6%, 81.3%, and 87.2% and in Hispanic/Latino subjects were 28.1%, 50.0%, 67.7%, and 80.0%. At week 56, least-squares mean percent WL was greater with 7.5/46 and 15/92 versus PBO across gender and race responders (P<.05; all comparisons). WL with 7.5/46 and 15/92 was greater in females vs males (P<.05) but not significant between race and ethnicity groups. Common adverse events—constipation, dry mouth, and paraesthesia—were similar across all strata. Conclusions: PHEN/TPM ER, as an adjunct to lifestyle modifications, can be an effective WL treatment for obese/overweight patients, regardless of gender, race, or ethnicity.

T-744-P
Cost of Completing 1 Year of Treatment with Phentermine/Topiramate Extended Release in an Overweight and Obese Population
Erin Zagadaiov, Thomas Bramley, Rashad Carlton Palm Harbor, FL; Sunil Karnawat, Weiyu Liu Mountain View, CA
Methods: The CONQUER study of obese/overweight subjects (BMI ≥ 27 to ≤ 29.9) and overweight (BMI ≥ 30) and overweight (BMI ≥ 27 to ≤ 29.9) and obese subjects (BMI ≥ 30) without diabetes. The PTMPM cost model, the cost PTMPM for patients who complete 1 year of therapy with phentermine/topiramate extended-release (PHEN/TPM ER) plus lifestyle modification (LM) compared with LM only. Methods: A 1-year model was developed from a health plan perspective using clinical trial data and published literature to estimate the PTMPM costs in an overweight (BMI ≥ 27 kg/m²) and obese population (BMI ≥ 30 kg/m²) completing 1 year of therapy. Costs include PHEN/TPM ER costs, medical and pharmacy cost offsets for comorbidities (diabetes, hypertension, dyslipidemia) and progression to these 3 comorbidities. PHEN/TPM ER costs are calculated using the current wholesale cost, dose utilization based on total dispensed pills, and average Tier 3 patient co-pay ($60). Results: In the model, the cost PTMPM for patients who complete 1 year of therapy with PHEN/TPM ER is $382.36 versus $385.24 for LM. This results in a PTMPM cost savings of $2.88 ($34.56 per treated member per year cost savings). Additionally, 82% of patients achieve the labeled indication weight loss targets to remain on therapy and did not discontinue due to adverse events. Common treatment-emergent adverse events were constipation, dry mouth, and paraesthesia. Conclusions: PHEN/TPM ER may be a cost-effective treatment option as the PTMPM costs demonstrate cost savings compared to LM for the overweight/obese population. With more than 8 out of 10 patients on PHEN/TPM ER achieving weight loss targets, health plans should expect to see considerable cost benefits from treatment.

T-745-P
Effect of Topiramate on BMI in Severely Obese Adolescents
Claudia K. Fox, Kara L. Marlatt, Aaron S. Kelly Minneapolis, MN
Methods: Adolescents with severe obesity respond marginally to lifestyle modification (LSM) alone, yet pharmacological options for use as an adjunct to LSM in this population are lacking. Topiramate, an antiepileptic medication that is believed to act at CNS reward centers and the hypothalamus to improve control of eating behavior and reduce appetite. Given that bupropion monotherapy is approved to treat MDD, NB therapy may be uniquely suited to treat overweight/obese individuals with MDD. Methods: A 12-weeks as a criterion for discontinuation of lorcaserin can help physi-
medication, is associated with weight reduction in obese adults, yet no studies have examined the effect of topiramate on obesity in adolescents. The purpose of this study was to examine the effect of topiramate plus clinically-prescribed LSM on BMI reduction in adolescents with severe obesity.

Methods: Data for this retrospective chart review were collected from patients enrolled over the past 3 years in a tertiary care, multidisciplinary pediatric weight management program. Patients included were those who were treated with LSM plus topiramate (median dose 75 mg daily, range 25 to 125 mg daily) for a minimum of 3 months. Paired t-tests were used to compare baseline and follow-up characteristics.

Results: Twenty-eight patients (71.4% girls, mean age 14.9 ± 2.6 years) were included for inclusion in this analysis. Baseline mean BMI was 45.3 ± 10.4 kg/m². After a mean treatment time of 7.8 ± 4.7 months, mean BMI decreased to 43.2 ± 10.3 (P = 0.0001). The mean BMI percent change from baseline was -4.8 ± 5.2%. A sub-analysis of patients (N = 14) who were not concurrently taking any other weight-altering medications or specialized diets demonstrated a mean BMI percent change from baseline of -6.1 ± 5.8% after a mean treatment time of 9.0 ± 5.5 months. Two of the 28 patients experienced paresthesias and one experienced hair thinning.

Conclusions: Topiramate with concurrent LSM was associated with clinically-meaningful BMI reduction and acceptable tolerability in adolescent obese patients. Randomized controlled clinical trials examining the efficacy and safety of topiramate for the treatment of severe obesity in this population are needed.

T-748-P
Eighty-Five Obese Hypogonadal Men with Type 2 Diabetes Treated with Testosterone Up to 6 Years Achieve Weight Loss and Improved Glycemic Control in an Observational Registry Study Farid Saad, Berlin, Germany; Ahmad Haider, Bremerhaven, Germany; Gheorghe Doros, Boston, MA

Background: Obesity is a risk factor for type 2 diabetes (T2D). In men, both diseases have a high prevalence of testosterone deficiency (hypogonadism), and testosterone treatment has been shown to improve weight and T2D. We studied the effects of normalising testosterone in obese hypogonadal men with T2D.

Methods: Cumulative, prospective, observational registry study of 300 men with testosterone levels below 12 nmol/L receiving testosterone undeconate injections for up to 6 years. We selected a subgroup of 85 men (mean age: 61.01 ± 4.84 years) with obesity and T2D.

Results: Mean weight (kg) decreased from 114.93 ± 11.88 to 93.19 ± 8.74. This decrease was statistically significant vs baseline (p < 0.0001) and each year compared to previous year. The mean change from baseline was -20.81 ± 0.63 kg. The mean percent weight loss (%) was 17.98 ± 0.51 after 6 years. Mean waist circumference (cm) decreased from 111.94 ± 7.05 to 100.85 ± 6.9. This decline was statistically significant vs baseline (p < 0.0001) and each year compared to the previous year. The mean change from baseline was -11.25 ± 0.31 cm. Mean BMI (kg/m²) decreased from 37.05 ± 3.62 to 30.45 ± 2.58. This change was statistically significant vs baseline (p < 0.0001) and each year compared to previous year. Mean fasting glucose decreased from 116.89 ± 13.88 to 96.12 ± 2.55 mg/dL (6.94 ± 0.77 to 5.34 ± 0.14 mmol/L) (p < 0.0001 vs. baseline, significant for the first 3 years vs previous year). HbA1c decreased from 8.21 ± 0.76 to 6.31 ± 0.50% (p < 0.0001 vs. baseline, significant for the first 3 years vs previous year). Conclusions: Correcting hypogonadism by testosterone treatment in obese hypogonadal men with T2D resulted in significant and sustained improvements in weight, waist circumference, fasting glucose and HbA1c over the full 6 years of the study.

T-747-P
Long-Term Treatment with Testosterone Undecanoate Injections Leads to Sustained Weight Loss and Improvement of Metabolic Syndrome Parameters in 381 Hypogonadal Men Farid Saad, Berlin, Germany; Michael Zitzmann, Muenster, Germany

Background: Testosterone deficiency (hypogonadism) is closely associated with obesity and metabolic syndrome in a bi-directional relationship. In our department for clinical andrology, we studied long-term effects of testosterone replacement therapy in men with hypogonadism of different etiologies. Methods: Prospective, cumulative, observational registry study including 381 men with testosterone levels below 12 nmol/L receiving testosterone undeconate injections for up to 16 years. 169 men had primary, 113 secondary and 99 mixed hypogonadism. The mean age was 42 ± 13 years (min. 15, max. 72).

Results: Mean weight (kg) decreased from 100.81 ± 11.8 to 86.5 ± 9.4. Mean waist circumference (cm) decreased from 113.2 ± 11.1 to 86.5 ± 9.4. Mean fasting glucose decreased from 116.89 ± 13.88 to 96.12 ± 2.55 mg/dL (6.94 ± 0.77 to 5.34 ± 0.14 mmol/L) (p < 0.0001 vs. baseline, significant for the first 3 years vs previous year). Conclusions: Correcting hypogonadism by testosterone treatment in obese hypogonadal men with T2D resulted in significant and sustained improvements in weight, waist circumference, fasting glucose and HbA1c over the full 6 years of the study.
decreased from initially 87% to 51% within 2 years and to 43% within 4 years. The parameters of the metabolic syndrome were measured.

Serum testosterone treatment in hypogonadal men resulted in significant changes in various parameters. Systolic blood pressure decreased by 150±14 mmHg from baseline to 131±11 mmHg (p<0.001 as ANOVA for LOCF for all parameters). Systolic blood pressure decreased by 150±14 mmHg from baseline to 131±11 mmHg (p<0.001 as ANOVA for LOCF for all parameters).

Results: Correcting hypogonadism by testosterone treatment in hypogonadal men resulted in significant and sustained improvements in waist circumference and weight and all other parameters of the metabolic syndrome.

T-750-P
Effects of Long-Term Treatment with Testosterone Undecanoate on Obese, Hypogonadal Men – An Observational Study
Farid Saad, Berlin, Germany; Ahmad Haider, Bremerhaven, Germany.

Background: Obesity can cause hypogonadism, and hypogonadism promotes further accumulation of fat mass in a vicious cycle. In excessively obese men (defined by BMI ≥ 40 kg/m2) awaiting bariatric surgery, a 75% prevalence of hypogonadism was found [1]. Testosterone treatment has been shown to improve body composition and reduce weight [2]. We studied the effects of normalized testosterone in hypogonadal men with excessive obesity.

Methods: Cumulative, prospective, observational registry studies of 561 men from two cohorts with testosterone levels below 12.1 nmol/L receiving testosterone undecanoate injections for up to 75 months. We selected a subgroup of 46 men with excessive obesity. Results: Average weight decreased from 129.02 kg to 105.59 kg. The average weight loss was 23.43 kg. The magnitude of weight loss was dependent on treatment duration, i.e., the longer the treatment, the greater the weight loss. Minimum weight loss was 5 kg in a subject who had received 15 months of treatment, maximum weight loss of 41 kg was observed in a man who had been treated for 69 months. No subject gained weight, and the weight loss was progressive over time. Average waist circumference decreased from 118.41 cm to 106.91 cm. The average reduction was 11.43 cm. The greatest reductions of 19 cm each were observed in two men who had been treated for 69 and 72 months, respectively. Conclusions: Treating hypogonadism by testosterone replacement in hypogonadal men with excessive obesity resulted in sustained improvements in weight and waist circumference in all subjects. The magnitude depended on treatment duration.


T-751-P
Two Hundred Seven Obese Hypogonadal Men Treated with Testosterone Undecanoate Up to 72 Months Progressively Lose Weight: An Observational Registry Study
Farid Saad, Berlin, Germany; Ahmad Haider, Bremerhaven, Germany; Gheorghe Doros, Alabamageddon Trust, Boston, MA

Background: Obesity induces male hypogonadism at all ages by various mechanisms affecting the hypothalamic-pituitary-gonadal axis. Low testosterone promotes further accumulation of fat mass thus creating a vicious circle. We analysed the effects of normalising testosterone in obese hypogonadal men. Methods: Cumulative, prospective, observational registry study of 207 obese men with testosterone levels below 12.1 nmol/L and a body mass index (BMI) of ≥30 kg/m2 receiving parenteral testosterone undecanoate 1000 mg/12 weeks following an initial 6-week interval for up to six years. Results: At the end of the observation period, mean weight (kg) decreased from 113.3±11.63 to 91.59±8.14. This decrease was statistically significant vs baseline (p<0.0001) and each year compared to previous year. The mean change from baseline was -20.6±8.4 kg. Mean waist circumference (cm) decreased from 110.57±6.3 to 99.35±7.11. This decline was statistically significant vs baseline (p<0.0001) and each year compared to the previous year except the last year where statistical significance was approached (p=0.0564). The mean change from baseline was -10.4±8.28 cm. BMI (kg/m2) decreased from 36.3±3.69 to 29.6±2.56. This change was statistically significant vs baseline (p<0.0001) and each year compared to previous year. The mean per cent weight loss (%) was 5.39±4.024 after 1 year, 9.49±4.25 after 2 years, 12.0±2.06 after 3 years, 14.39±0.26 after 4 years, 16.9±0.28 after 5 years and 18.15±0.33 after 6 years. Conclusions: Raising serum testosterone to normal resulted in loss of weight and waist circumference. Improvement in weight was progressive over the full 6 years of the study, improvement in waist circumference was progressive over 5 years and still approached significance at 6 compared to 5 years.

T-752-P
Liraglutide 3.0 mg Effects Similar Degree of Weight Loss Irrespective of Baseline BMI in the SCALE™ Maintenance Trial
Samuel Klein St Louis, MO; Vincent Woo, Winnipeg, Canada; Anjun Cao, Princeton, NJ; Thomas A. Wadden, Philadelphia, PA

Background: In the randomized, double-blind, placebo-controlled SCALE Maintenance trial, obese/overweight adults (BMI ≥30 kg/m2 or ≥27 kg/m2 with comorbidities) who lost ≥5% of initial body weight (BW) during a 4-12 week run-in period with low calorie diet (1200-1400 kcal/day), had further decreases in BW of (mean, % SD) 6.2±7.3% with liraglutide 3.0 mg/day (n=194) and 0.2±7.0% with placebo (n=188) after 56 treatment weeks. Randomized participants were also on a 500 kcal/day deficit diet and were encouraged to exercise. Transient gastrointestinal disorders were more common with liraglutide than placebo. The effect of baseline BMI on weight loss response to liraglutide is not known.

Methods: The percentage change in fasting BW from baseline (randomization, following a 5% BW loss) to week 56 for 4 fasting baseline BMI categories (<30 kg/m2, ≥30 to <35 kg/m2, ≥35 to <40 kg/m2, ≥40 kg/m2) was evaluated post-hoc using ANOVA with treatment, gender, country, co-morbidities stratification, baseline fasting BMI category and interaction between baseline fasting BMI category and treatment as fixed effects.

Results: For all baseline BMI categories, participants treated with liraglutide 3.0 mg lost a greater percentage of BW than those treated with placebo (p<0.002 for all). Placebo-adjusted weight loss in liraglutide-participants with baseline BMI ≤30 kg/m2, ≥30 to <35 kg/m2, ≥35 to <40 kg/m2 and ≥40 kg/m2 and corresponding baseline mean BW of 79.7, 90.6, 104.7, 127.7 kg, was (mean,SE) 6.5±1.9% (n=59), 5.6±1.2% (n=152), 6.8±1.5% (n=94) and 5.2±1.6% (n=77) of baseline BW, respectively, after 56 treatment weeks. Treatment effect (% BW loss at week 56) was similar across the 4 BMI categories (p=0.87).

Conclusions: Percent BW loss induced by liraglutide 3.0 mg/day plus diet therapy is similar across all baseline BMI categories.

T-753-P
Health-Related Quality of Life in Overweight and Obese Patients Treated with Lorcaserin
Zhihao Wang, Xuan Li, Annette Powers Woodcliff Lake, NJ; Ken Fujioka La Jolla, CA

Background: Obesity increases risk for multiple comorbid conditions and is detrimental to patient’s health-related quality of life (HRQOL). Lorcaserin is a pharmacotherapy approved in the US for chronic weight management in obese (BMI≥30) and overweight (BMI 27.2-29.9 with ≥1 WRC) and obese (BMI 30-45) patients (18-65 years) without diabetes. The Impact of Weight on Quality of Life–Lite questionnaire (IWQOL-Lite) was used in both studies and data were pooled for the analysis. Patients were categorized by baseline IWQOL-Lite total scores (no/mild/moderate/severe impairment) and 52-week weight change (weight gain, 0-4.9%/5-9.9%/10% weight loss). Percentage of patients achieving clinically meaningful improvement (CMI) in each category was reported. Multivariate regression was used to assess the effect of lorcaserin on HRQOL.

Results: 55% of patients receiving lorcaserin reported CMI at 52 weeks compared to 48.8% in the placebo group. In patients receiving lorcaserin who achieved ≥5% weight loss at 12 weeks (12-week responders), 63.7% reported CMI at 52 weeks. Baseline HRQOL and weight, and 52-week weight change were significantly associated with change in HRQOL (p<0.0001). After controlling for age, gender, baseline HRQOL and weight, and 52-week weight change, the effect of lorcaserin on HRQOL vs. placebo was not significant.

Conclusions: This analysis suggested that weight loss could potentially improve patients’ HRQOL. More patients using lorcaserin in conjunction with diet and exercise improved HRQOL than those with diet

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T-754-P
Weight Changes At 6-Month Follow-Up After Discontinuation of Double-Blind Drug Intervention or Placebo
Jim Ho Shih, Kishore M. Gadde, Durham, NC

Background: Although it is generally believed that obese patients who lose weight with pharmacotherapy tend to regain their lost weight soon after discontinuation of the intervention, follow-up data from clinical trials are sparse because patients are seldom followed beyond the intervention period.

Methods: In a previously reported clinical trial, 225 obese patients were randomly assigned to treatment with daily placebo, zonisamide 200 mg, or zonisamide 400 mg for 1-year, at which point the study interventions were discontinued. A total of 154 (93 women, 61 men) of the 218 patients who completed the original 1-year study returned for 6-month follow-up visit to provide weight; they also completed a brief questionnaire. For data analysis, we defined weight-maintainers as who lost weight or gained <2% (n=88 [57%]) and weight-gainers as those who gained ≥2% weight (n=66 [43%]) during the follow-up period.

Results: For this cohort of 154 patients, mean weight changes at 12-months were -3.8% for placebo (n=53), -3.8% for zonisamide 200 mg (n=49), and -8.4% for zonisamide 400 mg (n=52); corresponding weight changes at 6-month follow-up off-treatment were 0.3%, 1.3%, and 3.3%, respectively (P<.001). Greater proportion (77%) of weight-gainers reported increased appetite at 6-month follow-up compared with weight-maintainers (54%, P<0.01).

Conclusions: Patients assigned to zonisamide 400 mg achieved greater weight loss than placebo at 1-year. Weight regain for zonisamide 400 mg patients was greater than for placebo patients at 6-month follow-up, which may be attributable to return of the previously suppressed appetite.

T-755-P
Effects of Icosapent Ethyl (Eicosapentaenoic Acid Ethyl Ester) on Pharmacokinetic Parameters of Rosiglitazone in Healthy Subjects
Rene Breackman, Bedminster, NJ; William Sirttun, Parames N. Somi Groton, CT

Background: Icosapent ethyl (IPE; formerly AMR101) is a high-purity prescription form of eicosapentaenoic acid (EPA) ethyl ester approved in the United States as an adjunct to diet to reduce triglyceride levels in adults with severe (>500 mg/dL) hypertriglyceridemia. Candidates for triglyceride-lowering therapy include patients with type 2 diabetes mellitus who may be receiving rosiglitazone, a thiazolidinedione antidiabetic agent and cytochrome P450 (CYP) 2C8 substrate. The purpose of this study was to assess the effects of IPE on the pharmacokinetics (PK) of rosiglitazone. Methods: Subjects received a single 8-mg oral dose of rosiglitazone alone and with oral IPE 4 g/day in this open-label, crossover, drug-drug interaction study. Primary and secondary PK end points included area under the concentration-versus-time curve from time zero to infinity (AUC_τ, primary) and maximum plasma concentration (C_{max}; secondary) for rosiglitazone with and without IPE. Results: Of the 30 patients enrolled, 28 completed the study. IPE 4 g/day at steady state did not significantly change the single-dose AUC_0-inf or C_{max} of rosiglitazone at 8 mg. Least squares geometric mean ratios (90% confidence interval) for AUC_τ, C_{max}, and C_{τ,h} of rosiglitazone given with IPE versus rosiglitazone alone were 0.90 (87.00-93.40) and 1.01 (92.02-109.9), respectively. No serious adverse events were reported and no subject discontinued this study due to an adverse event. Conclusions: At steady-state concentrations, IPE did not inhibit the metabolism of rosiglitazone, a CYP2C8 substrate. Coinadministration of IPE and rosiglitazone was safe and well tolerated in this PK study of healthy adult subjects.

T-756-P
Five-Year Maintenance Results of an Obesity Drug Following a Very Low Calorie Diet (VLCD)
Judy F. Loper, Rich Lutes, Edward Baltes, John T. Broyles, Robert May

Background: Long-term weight maintenance needs to be improved. The purpose of the study was to examine the effects of using a combination of treatments (VLCD and phentermine) to help subjects maintain their weight lost.

Methods: Three hundred, ninety-six subjects (326 females and 70 males) enrolled in an open-label study, and used either OptifastTM 800 or regular food (800 calories) for a minimum of eight weeks. Following the VLCD, subjects were prescribed phentermine HCL (18.75-37.5 mg/day) and their diets adjusted to low calorie diets (LCD) for the duration of the study. Each subject had the ability to follow the protocol for five years. Treatment included an individual visit with the physician and registered dietitian every 2-4 weeks. In addition, subjects were offered group classes on lifestyle change, nutrition education, and physical activity. Results: The age range of the subjects was 20-75 years with a mean age of 47.9. Mean initial BMI was 38.84, and following the VLCD was 33.2. Mean baseline weight was 240.8 lbs, 206.3 lbs at the end of the VLCD, 194.1lbs after 1 year, 199.2 lbs after 2 years, 201 lbs after 3 years, 190.4lbs after 4 years, and 200.4 lbs after 5 years. The mean last recorded weight including dropouts was 206.3 lbs. The drop out rate before year 2 was 266 subjects or 68%. Reasons for the drop outs were: elevated BP-5, heart racing-4, and agitation-3. Other side effects noted were stomach cramps, sleep disturbances, and dry mouth.

Conclusions: Subjects enrolled in the combination therapy showed a 15% reduction in body weight (taking the last recorded weight). Despite the high drop-out rate, those continuing in treatment continued to do well. Thus, VLCD and phentermine were effective in helping subjects keep off excess body weight long-term. Frequent office visits, phentermine, and VLCD may all have contributed to the positive results.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Clinical Practice Based Trials
T-757-P
Outcome of a Primary Care Based Intervention to Prevent Obesity in Young Children: Steps to Growing Up Healthy
Michelle M. Cloutier, James Wiley Hartford, CT; Dominica B. Hernandez Storrs, CT; Annamarie Beaulieu, Authenerie Grant Hartford, CT; Amy A. Gorin Storrs, CT

Background: Obesity disproportionately affects low-income children and begins early in life. The goal of Steps to Growing Up Healthy is to decrease obesogenic behaviors and prevent/reverse obesity in low-income Hispanic and Black children ages 2-4 years. Methods: The intervention utilized brief motivational counseling delivered by primary care clinicians and nurses with telephone follow-up 5-7 days after the clinic visit. During each routine clinic visit, the medical team facilitated the selection of a specific goal (e.g., reduce juice/SSB) that was meaningful to the mothers, taught mothers simple behavioral strategies (e.g., self-monitoring) and together created a written action plan. BMI%tile and obesogenic behaviors were monitored at baseline and 12 months and were compared to a historical control group from the same clinic of similar age and ethnicity. Results: 232 mothers and children (86% Hispanic, 50%±4.5 8.7 months, 17% overweight, 28% obese) participated; 12-month data were available in 197 (85%). Participants reported multiple obesogenic behaviors at baseline and received 2.8 ± 1.3 (mean ± SD) intervention doses (range 1-7) over the intervention period. There was no significant change in BMI%tile in study completers (75.9 ± 24.8 to 75.6 ± 25.7, change ±20.1%tile at 12 months (p=0.87). In contrast, BMI%tile increased 8.3 ± 25.7%tile at 12 months in the historical control group as compared to intervention participants (p=0.001). Conclusions: A brief intervention delivered at routine clinic visits by primary care clinicians and nurses over a 12 month period blunted BMI%tile increases in low-income Hispanic and Black children.

T-758-P
What’s Diet Got To Do with It? Examining the Relationship between Food Security, Dietary Intake and Child BMI
Christine M. Trapp Hartford, CT; Amy A. Gorin Storrs, CT; James Wiley, George Burke Hartford, CT; Dominica B. Hernandez Storrs, CT; Rebecca E. Crowell, Authenerie Grant, Annamarie Beaulieu, Michelle M. Cloutier Hartford, CT

Background: Food insecurity has been associated with child obesity in the literature. This study examines the association between household food security, dietary intake and BMI in low-income preschool children at risk for obesity. Methods: Caregivers (N=226) with children aged 2-4 years were enrolled in an urban primary care-based obesity prevention study (Steps to...
Growing Up Healthy) between October 2010-December 2011. At baseline, demographic data, household food security status (U.S. Household Food Security Instrument) and dietary intake (Children’s Dietary Questionnaire) were collected. BMI was calculated from anthropometric data. Results: Participating children were primarily Hispanic (48%), 50.6% female, 35.8±6 months; 18% overweight; 29% obese). Forty-five percent of households reported food insecurity, which was not associated with child age, sex or ethnicity. No direct relationship was seen between household food insecurity and BMI. In food secure homes, obesity rates increased with increasing age (15%, 38% and 50% for 3, 5 and 6 year olds, respectively; p=0.005) and were associated with greater soda consumption at 4 years compared to younger ages (P=0.05). This linear increase in weight was not observed in the food insecure group and children at 4 years from food insecure households did not increase their consumption of soda. No other differences in diet were observed between the two groups. Conclusions: Food insecurity is common among low-income children. Food secure households have higher rates of obesity with increasing age, which are associated with increased soda consumption. This association is not seen in food insecure homes. These data support a complex relationship between food security, dietary intake, and child BMI.

T-759-P
Factors Associated with Unsuccessful Weight Loss as 3 Years After Bariatric Surgery in a Mediterranean Population
Violeta Mozeta, Alba Andrea, Ferran Torres, Emilio Ortega, Lucia Rodriguez, Josep Vidal Barcelona, Spain

Background: Bariatric Surgery (BS) is the most effective weight loss (WL) therapy for morbid obesity. However, insufficient WL and weight regain are commonly seen at long term follow up. Methods: We evaluate the prevalence of WL failure (% Excess Weight Loss<50%) at 3 years (y) after BS, and its relationship with eating behaviour (Binge Eating Disorder (DSM-IV) and Three Factor Eating Questionnaire (TFEQ)), and quality of life (QoL) (by Moorehead-Ardelt QoL Questionnaire) in a Mediterranean cohort. 240 individuals (male: 22%; age: 46.2±11y, BMI: 47.4±6.2 kg/m2), undergoing gastric bypass (GBP, 85%) or Sleeve Gastroctomy (SG,15%) at a single-center were prospectively assessed before surgery and yearly thereafter up to 3 y. Results: At 3 y, failure rate was 15% and did not differ between surgical groups (BPG: 80% vs SG: 20%; p=ns). Baseline BMI was comparable between WL-failure(F) and WL-success(S) groups. WL-F tended to be more frequent in women than men (67% vs. 33%; p=0.07). Age >50, and menopausal status at the time of surgery were associated with higher prevalence of WL-F (respectively, p=0.01 and p=0.04) 63%). %EWL at 12 months was lesser in the WL-F relative to the WL-S group (50±10% vs 76±16%, p<0.001). Likewise, estimated daily Kcal intake at 12 months was higher in the WL-F than in the WL-S group (1742±489 vs 1332±468 kcal; p<0.001). Failure at 3 y was more prevalent in individuals with BED at 12 months (11% vs 2%; p=0.04) and in those who scored higher on the TFEQ total score (20±6 vs.17±5; p=0.006). QoL at 3 y was higher in the WL-S compared to the WL-F group (1.14±1 and 0.28±1; p=0.01). Conclusions: At 3 years follow up, the rate of WL-F does not differ between RYGBP and SG. WL-F is associated with unfavourable eating behavior and higher energy intake at 12 months, and has negative impact on QoL.

T-760-P
Altersations in Diabetic Medications and Resultant A1C Values Among Patients with Diabetes Enrolled in a 1-Year Behavioural Weight Management Program with Meal Replacement– Observations from the CORE Program at the Ottawa Hospital Weight Management Clinic Judy Shiau, Mary-Ellen Harper, Ruth McPherson, Robert Dent Ottawa, Canada

Background: Diabetic (DM) patients undergoing weight loss may experience hypoglycemia and require medication alteration. There is a paucity of data on DM medication alteration and its effect on glycemic control in this population. Methods: A retrospective cohort study was conducted on consecutive patients enrolled from 1992 to 2009 in a year-long behaviour program which uses the Optifast 900® meal replacement for the first 6-12 weeks. Baseline and 6 month DM medications and glycemic profile were collected. Patients with DM medication regimens associated with weight gain (group A) were compared to those solely on the weight neutral medication regimens (metformin as alpha-glucosidase inhibitors (AGI), group B). Results: Overall, all glycemic data was available for 2744 patients, with 456(20.1%)identified as DM and 91(3.3%) as having impaired fasting glucose (IFG). Among DM patients: 95 (20.8%) were not on medications, 269(59.0%) were in Group A and 92(20.2%)in Group B. Baseline medications by % DM treated include: 34.3% sulfonylurea (SU), 16.7% thiazolidinediones (TZD), 19.7% insulin, 1.7% meglitinides (SU), 6.0% DPP-4 inhibitors (DPP4), 56.4% metformin and 1.9% AGI. Decrease or discontinuation of medications over 6 months occurred in: 81.5% SU, 68.4% TZD, 25% meglitinides, 33.3% DPP4, 28.8% metformin and 88.9% AGI. Baseline vs. 6 month A1C by groups were: 0.075 vs. 0.079 (NS) for Group A and 0.067 vs. 0.058 (NS) for Group B. Conclusions: Reduction or discontinuation of DM medications is common among patients enrolled in a meal replacement program. This practice appears safe with no significant compromise of A1C levels, irrespective of DM medication regimen.

T-761-P
Psychosocial Symptoms and Health-Related Quality of Life in Children at a Tertiary Care Obesity Program
Rose L. Schroedi, Amy E. Baughcum, Rosanna Watoowica, Andrea Spinella, Travis Gallagher, Alexis Kleneke, Carrie A. Tolman, Cynthia Vensel, Jihonna Eneli Columbus, OH

Background: Obese youth experience poor health-related quality of life (HRQOL) and are at increased risk for psychological problems. The relationship between these constructs in obese youth is not well understood. The purpose of this project was to investigate the relationship between psychosocial symptoms and HRQOL in obese youth. Methods: A chart review was conducted for 226 patients aged 8 to 18 seen in a tertiary-care center from January -December 2011. Referral to the center requires a BMI ≥ 95%. HRQOL was assessed with the Pediatric Quality of Life Inventory 4.0 (PedsQL 4.0). Higher scores represent better HRQOL. Mental health symptoms with the Pediatric Symptom Checklist (PSC), a brief mental health screener consisting of a total score and three subscales (internalizing, externalizing, and attention). Results: Participants were 52% Caucasian, 44% male, 35% over age 12 and mean BMI Z-score of 2.29. Mean total PedsQL 4.0 score was 67.5 for parents and 75.1 for children. Youth with BMI ≥99th%ile (49%) experienced poorer quality of life compared to youth with BMI 95-99th%ile, as reported by children (z 215, 226) = 9.86, p<0.01) and parents (z 215, 226) = 12.5, p<0.01. Of the 226 subjects, 26% had an abnormal PSC total score (≥15), with internalizing symptoms (26%) most common, followed by externalizing (15%) and attention symptoms (8%). Youth with BMI ≥99th%ile reported more internalizing symptoms compared to youth with BMI 95-99th%ile (p<0.02). In regression analysis, controlling for age, gender, race and insurance status, higher total PSC scores were significant of lower parent and child total PedsQL scores (p<0.01). Conclusions: A BMI ≥99th%ile was associated with poorer HRQOL and greater psychosocial problems. Given the relationship between psychosocial symptoms and HRQOL, a greater emphasis on behavioral intervention may be needed for obese youth.

T-762-P
Primary Care Providers Who Convey Negative Weight-Related Attitudes Influence Patients’ Weight Loss
Kimberly Guzdhune, Wendy L. Bennett, Lisa A. Cooper, Sara N. Bleich Baltimore, MD

Background: Obese patients often report negative experiences with healthcare providers. It is unclear how provider attitudes influence weight loss. We examined the association between weight loss and negative primary care provider (PCP) attitudes about weight. Methods: We conducted a national, internet-administered survey of 600 adults with BMI ≥25 kg/m2 who visited their PCP within the last 12 months. Our weight loss outcomes were 1) attempted weight loss and 2) reported a 10% weight loss in the last 12 months. Our independent variable was “feeling judged by my weight by my PCP,” dichotomized as “often or sometimes judged” vs. “never.” We examined an interaction between being judged and PCP discussing weight loss as an independent variable. Using survey weights, we performed multivariate logistic regression adjusted for age, sex, race, BMI, PCP relationship duration, PCP race and PCP BMI. Results: Mean age was 47.4 years, 48% were female, and 21% reported that their PCP judged them about their weight. Patients who felt judged were significantly more likely to attempt weight loss [OR(87), p=0.01]. However, there were no more differences in achieving 10% weight loss [OR(87), p=0.69]. As compared to patients who were not judged Weight Loss [OR(87), p=0.69]. As compared to patients who were not judged...
and whose PCP did not discuss weight loss, those who were not judged and whose PCP did discuss weight loss were significantly more likely to achieve a 10% weight loss [OR=3.6, p<0.01]. In contrast, those who felt judged, regardless of whether or not their PCP discussed weight loss, were not more likely to achieve this weight loss goal [Judge+N=Discussed: OR=1.71, p=0.51; Judge+N=Discussed: OR=2.70, p=0.06]. Conclusions: While PCP attitudes may prompt weight loss attempts, our results suggest that patients may be more successful losing weight if PCP weight loss counseling occurs within relationships free from judgment about being overweight.

T-763-P
Human Chorionic Gonadotropin (HCG) Administration Prevents Muscle Mass Loss, a Randomized Double-Blinded, Controlled Clinical Trial
Sheri Emma Brick, NJ
Background: This controversial topic has been under investigation for over sixty years. Repeated clinical trials have failed to show any significant difference in weight loss between HCG and placebo. The proposed theory is that HCG is not producing weight loss but serves to counteract muscle catabolism during a calorie-deprived state. Methods: 59 females between 20 and 55 were randomized to HCG or Placebo Study Groups. Recorded variables: weight, body composition, blood pressure, blood labs (CBC, complete metabolic panel, thyroid panel, and B-HCG). All were placed on a 500 calorie diet (50% protein, 50% complex carbohydrates). Subjects injected 200-300 IU subcutaneously daily for 4 weeks. Weekly follow-up visits recorded weight, blood pressure, and medical evaluation. Blood was taken every 2 weeks for electrolyte and lipid monitoring. Results: Mann-Whitney U Test Median Comparison: HCG vs. placebo. Muscle retention was greater in HCG group (p=0.0303). No significant difference in weight loss (p=0.5521) or fat mass loss (p=0.4189). Conclusions: HCG acts on LH receptors, creating an increase in anabolic hormones thereby preventing muscle breakdown during a very low calorie diet (VLCD). It is proposed that rather than HCG being perceived as a weight loss hormone, it should be considered an adjunct during a VLCD to prevent sarcopenia which can aid rapid weight loss methods, including weight reduction surgery. More research is warranted in this area.

T-764-P
Are There Differences between Presurgical and Nonsurgical Patients in a Multidisciplinary Medical Weight Management Program?
Dayna Charbonneau, Leslie M. Schuh, Adrienne Gomez, Christina Reed, Lori Hurst, Barbara Neumann, David Creel Carmel, IN
Background: Insurance requirements for bariatric surgery often include 3-6 months of medically supervised weight loss. According to NIH Obesity Guidelines, approximately 8% weight loss is expected in 6-12 months of medical treatment for obesity. Methods: A retrospective chart review of presurgical patients (N=707) and nonsurgical patients (N=237) in a multidisciplinary medical weight loss program at the St. Vincent Carmel Bariatric Center of Excellence included those beginning treatment between 8/2/2005 and 2/19/2013. At 6 months, presurgical patients attended up to 7 sessions and nonsurgical patients 18. Results: Patients included 742 females and 202 males aged 44.6 years. Presurgical patients entering medical weight management had significantly higher weights and BMIs compared to nonsurgical patients (299.2 lbs and 48.2 units, respectively) than nonsurgical patients (254.4 lbs and 40.9 units, respectively). At 3 months, nonsurgical patients (N=146) had significantly greater percent weight loss (6.2%) than presurgical patients (N=59; 1.0%). Similarly, at 6 months, nonsurgical patients’ (N=85) percent weight loss (9.8%) was significantly greater than presurgical patients’ (N=331; 1.4%). Conclusions: Nonsurgical patients lost more weight in a medical weight loss program than presurgical patients. Only nonsurgical patients’ weight loss at 6 months met NIH Obesity Guidelines. Treatment intensity, with nonsurgical patients attending more sessions than presurgical patients at 6 months, may contribute to differences. Alternatively, nonsurgical patients may be more motivated to adhere to a medical weight loss program, whereas presurgical patients anticipate significant weight loss post-surgery. Presurgical patients may be less motivated to lose weight because participation is an insurance company requirement and not necessarily voluntary.

T-765-P
Medical Weight Loss Versus Bariatric Surgery: Does Method Impact Body Composition and Weight Maintenance After 15% Reduction in Body Weight?
Michelle G. Kulovitz, Deborah Kolkmeyer, Carole A. Conn, Deborah A. Cohen, Robert T. Ferraro Albuquerque, NM
Background: This study investigated body composition changes in fat mass (FM) to lean body mass (LBM) ratios following 15% body weight loss (WL) in both integrated medical treatment and bariatric surgery groups. Methods: Obese patients, BMI=46.6±6.5 kg/m2, who underwent laparoscopic gastric bypass surgery (BS), were matched with 24 patients undergoing integrated medical and behavioral treatment (MT). The BS and MT groups were evaluated for body weight, BMI, body composition, and waist circumference at baseline and after 15% WL. Results: Following 15% body WL, there were significant decreases in %FM and increased %LBM (p<0.0001). Additionally, both groups saw 76% of WL from FM, and 24% from LBM indicating a 3:1 ratio of FM to LBM loss during the first 15% reduction in body weight. Lastly, no significant differences (p=0.103) between groups for maintenance of weight loss at one year were found. For both groups, baseline FM was found to be negatively correlated with percentage of weight regained (%WR) at one year post-WL (r=-0.457, p=0.007). Baseline waist circumference and rate of weight loss to 15% were significant predictors of %WR only in the BS group (r=0.713, p=0.020). Conclusions: If followed closely by professionals during the first 15% body weight loss, patients losing 15% weight by either medical or surgical treatments can attain similar FM:LBM loss ratios and can maintain weight loss for one year.

T-766-POT
Barriers to Initial Behavior Change in a Primary Care-Based Obesity Prevention Program for Young Children
Dominica B. Hernandez, Michelle M. Cloutier, James Wiley, Annamarie Beaulieu, Amy A. Gorin Storrs, CT
Background: Children of color are disproportionately affected by obesity creating a need for effective prevention programs. This study investigated a first dose response to a pediatric primary care-based obesity prevention program (Steps to Growing Up Healthy) targeting Hispanic and Black children. We examined whether mothers experienced barriers to behavior change and if maternal, child, environmental, or intervention variables predicted barrier status. Methods: Hispanic and Black mothers and their children (N=234; 51%; 88.9% Hispanic; 35; 4.7 months) were recruited from an urban primary care clinic. The intervention utilized brief motivational counseling delivered by clinicians and nurses with the goal of reducing obesogenic behaviors. During a routine clinic visit, the medical team facilitated the selection of a specific goal (e.g., reduce SSB) that was meaningful to the mothers and taught mothers simple behavioral strategies (e.g., self-monitoring). Study staff conducted follow-up phone calls 5-7 days after the visit, reviewed the selected goal, and assessed whether the mother experienced a barrier to behavior change. Results: 16.8% of mothers experienced a barrier to behavior change in the week following the first intervention dose. Logistic regression models identified mothers’ confidence (p<.05) and child sex (p<.01) as predictors of barrier status. Mothers who were “somewhat” or “not confident” were 6.21 times more likely to report a barrier than mothers who were very confident and mothers were .351 times more likely to identify a barrier if their child was male. Conclusions: Obesity prevention programs may be well served to address maternal confidence levels especially with regard to their son’s obesogenic behaviors.

T-767-P
Practice Patterns for Managing Patients Who Are Obese: Primary Care Physicians (PCP), Cardiologists (CARD), Endocrinologists (ENDO) and Bariatricians (BARI)
Terry A. Glauser, Nancy Roepke, Benjamin Whitfield Birmingham, AL; Boris Stevenin, Anne Marie Dubois, Soo M. Ahn Plainfield, NJ
Background: 35.7% of U.S. adults are obese. What do physicians know and do to manage these patients? Methods: CE Outcomes sent a survey to 1,660 US physicians to assessed practice patterns of PCP, CARD, ENDO and BARI managing obesity to identify educational need. Results: 100 PCP, 70 CARD, 100 ENDO, 30 BARI responded. 20% of PCP, CARD and ENDO did not see obesity as a disease. 18% PCP, 27% CARD, and 36% ENDO did
not think they could help obese patients achieve a healthy weight. Half or fewer of BARI were very familiar with USPTF, NHLBI, AACE, ICSI guidelines. ENDO (40%) and PCP (28%) were very familiar with AACE, USPTF guidelines, respectively. Few CARD were familiar with guidelines. More than 20% ENDO, 30% BARI, 70% CARD and 80% PCP could not identify a hormone that increases food intake. Initial management varied; most suggested eschewing high calorie drinks, engaging in aerobic exercise. Reasons to start weight-loss medication: comorbidities, BMI ≥ 30 kg/m², failure to lose weight after lifestyle advice but lacked consensus. PCP (62%), CARD (60%) and ENDO (30%) expected more weight loss in the 1st year of medication use than is achievable or were unsure. One year after Roux-en-Y, 74% PCP, 68% CARD, 51% ENDO and 33% BARI expected less excess weight loss than is actually achieved or were unsure. **Conclusions:** 1/5 of PCP, CARD and ENDO do not see obesity as a disease, feel they cannot help obese patients achieve a healthy weight. No specialty was very familiar with any obesity guidelines. There may be gaps in knowledge of obesity pathophysiology. All lack consensus on how to initially help with weight loss, reasons to start medication. Majority are unsure or overestimate weight loss from medications and are unsure or underestimate weight loss from surgery. There is a need for education about obesity to physicians caring for these patients.

**T-769-P**
**Use of Electronic Health Records for Addressing Overweight and Obesity in Primary Care: Preliminary Results from a Cluster-Randomized Controlled Trial**
Heather J. Baer, Deborah H. Williams, Christina C. Wee, David W. Bates
Boston, MA

**Background:** Primary care clinicians often fail to diagnose overweight or obese patients or counsel them about weight loss. Electronic health records (EHRs) could assist clinicians with diagnosis and management of overweight and obesity. **Methods:** We conducted a cluster-randomized controlled trial in primary care practices at Brigham and Women's Hospital. We developed several new features within the EHR, including reminders to measure height and weight (Stage 1); alerts to add overweight or obesity to the problem list, and patient-specific management recommendations (Stage 2). We randomized 23 clinical teams to have access to the new features (intervention group) or not (control group). We examined changes in documentation of body mass index (BMI) and diagnosis of overweight and obesity in the EHR during the 6 months before and after the intervention. **Results:** A total of 65,278 patients had visits during Stage 1 and 58,647 patients had visits during Stage 2. During Stage 1, documentation of BMI increased from 91.0% to 93.8% in the intervention group and from 87.3% to 91.1% in the control group (p = 0.15). During Stage 2, diagnosis of overweight or obesity on the problem list for patients with BMI ≥ 25 increased from 18.1% to 55.4% in the intervention group and from 15.0% to 20.7% in the control group (p < 0.0001). A sample of 2400 overweight or obese patients were mailed a survey after their primary care visit and 619 patients completed it; 60.7% of intervention vs. control group. We examined changes in documentation of body mass index (BMI) and diagnosis of overweight and obesity in the EHR during the 6 months before and after the intervention. **Conclusions:** A majority of patients said that their clinician helped them set a specific weight loss goal (p = 0.05). More than 20% BARI, 30% ENDO and 40% PCP indicated that they counsel patients about weight loss. ENDO (40%) and PCP (30%) indicated that they are more likely to counsel patients about weight loss if they perform a weight check during a primary care visit.

**T-770-P**
**Maternal Self-Efficacy and Health Behaviors**
Kathy S. James San Diego, CA; Panagiotis Matsangas Athens, Greece; Cynthia D. Connelly San Diego, CA

**Background:** Understanding contributors to family health is important in practice. Family health is a system comprised of routines or habitual practices. Among numerous facets of everyday life, it may include nutrition, activity, smoking, or sleeping habits. Mothers have a large influence on their children. As part of a study regarding family nutrition and activity patterns, we investigated the association between maternal self-efficacy, family nutrition and physical activity patterns, and self-reported sleep patterns, in a sample of overweight mothers. **Methods:** In a descriptive, quasi-experimental study, ninety eight females completed Family Nutrition and Physical Activity (FNPA) and a Self-efficacy survey which assessed family behaviors predictive of childhood obesity and how sure the mothers were that they could motivate themselves to carry out healthy promoting behaviors. **Results:** The majority of children (n=171) had healthy weight (n=89, 53.6%), 15 were underweight (9.04%), 23 overweight (13.9%), and 39 obese (23.5%). Mothers with normal weight had increased confidence scores (p = .062). Maternal confidence score was associated with the FNPA total score and with family and meal patterns (p=.037), restriction/reward (p=.002), screen time behavior and monitoring (p=.006), family activity involvement (p=.006), and family routine (p=.077). Analysis of children’s sleep and maternal confidence showed that mothers who reported their children (5 to 10 years old) getting at least 10 hours of daily sleep have increased confidence scores (p=.026). Conclusions: The study emphasizes the significance of positive confidence and role modeling healthy behaviors that prevent obesity. Correlation does not indicate cause and effect but an awareness of maternal influence on family habits is important.

**T-771-P**
**The Evaluation of a Non-Invasive Respiratory Volume Monitor in Obese Patients**
Jonathan Lee Wallihan, MA; Diane Ladd Morgantown, WV; Adam Glasgow Norwood, MA

**Background:** Obese patients have a greater risk of post-surgical respiratory complications. Pain management with opioids, a leading cause of postoperative respiratory compromise, is especially challenging in obese patients because of physical and anthropomorphic differences. Respiratory monitoring has previously been suboptimal in non-intubated patients. A novel, non-invasive Respiratory Volume Monitor (RVM) has been shown to provide accurate, continuous, real-time measurements of minute ventilation (MV), tidal volume (TV) and respiratory rate (RR) in postoperative patients. **Methods:** Digital respiratory curves were collected during 1-minute breathing tests (1740 tests, 66 visits) from obese subjects (age 19-79yrs; BMI 35.0-60.5kg/m²) at Mass Weight Loss, Norwood, MA with an impedance based RVM system (ExSpiron, Respiratory Motion, Waltham, MA) and a spirometer during normal, deep and shallow breathing. After calibration, accuracy & precision of RVM measurements of MV, TV & RR were compared to spirometry values. **Results:** RVM volume data correlated strongly with spirometric data, with median correlation across all subjects of r=0.97. The average MV & TV measurement accuracy error was 12.6%±4.3% and 12.3%±4.1%, respectively (mean ±SEM). RR measurement error was 2.0±1.1% across all subjects. The measurement bias in all 3 metrics was less than 1% on average.
Liquid Meal Replacement Diet: A Preliminary Study

Colleen S. Thomas, Julia E. Crook, Gretchen E. Ames, Roshni H. Patel, Jillian McMullen, Scott A. Lynch

Objective: To conduct a preliminary assessment of the effectiveness of a small change maintenance intervention (SCM) for patients who completed a liquid meal replacement program (LMR) modified their weight loss goals and lifestyle behaviors. 

Methods: Patients who completed a liquid meal replacement program (LMR) modified their weight loss goals and lifestyle behaviors. 

Results: Favorable satisfaction ratings were observed following the intervention. Participants reported an improvement in overall health, a decrease in weight regain, and an increase in physical activity. 

Conclusions: SCM holds promise for improving weight maintenance after large weight loss. Future research should compare SCM to standard maintenance programs that promote large program-directed changes.

T-774-P

Encouraging Realistic Expectations for Body Weight After Large Weight Loss: A Preliminary Study

Gretchen E. Ames, Roshni H. Patel, Jillian McMullen, Scott A. Lynch, Colleen S. Thomas, Julia E. Crook

Objective: To determine if patients who have undergone bariatric surgery are realistic about their weight loss expectations and if unrealistic expectations are associated with weight regain. 

Methods: Participants were asked to rate their expected weight loss on a scale of 1-10, with 1 being "excessively optimistic" and 10 being "excessively pessimistic." 

Results: Participants who rated their expected weight loss as higher than their actual weight loss were more likely to experience weight regain. 

Conclusions: Unrealistic expectations about weight loss can negatively impact patient outcomes. 

T-775-P

Use of Hand Held Indirect Calorimetry (HHIC) in a Multi-Specialty Obesity Practice: Setting Expectations and Validation in Clinical Practice - Beyond Technical Variation

Sasha Stiles

Objective: To evaluate the feasibility and utility of using HHIC in a multi-specialty obesity practice. 

Methods: Participants' resting energy expenditure was measured using HHIC. 

Results: There was a significant correlation between HHIC and double indirect calorimetry. 

Conclusions: HHIC is a feasible and valuable tool in clinical practice.
Clinical Studies on Mechanisms, Including Imaging

T-776-P  The Power of Food: Relationships between Delay Discounting and Eating Behavior
Stephanie P. Goldstein, Stephanie M. Manasse, Evan M. Forman, Laura A. Berner, Meghan L. Butryn, Andrew F. Frohn Philadelphia, PA

Background: A growing line of research has shown that there are several neurocognitive processes that are associated with obesity. In particular, over-weight and obese individuals have a tendency to undervalue postponed rewards in favor of smaller immediate rewards (i.e., delay discounting; DD) when compared to normal weight individuals. It stands to reason that those with low appetitive responses do not view food as much of a reward to delay as those with high appetitive responses, thus individuals with high appetitive response and steeper DD might struggle more with weight control behaviors. The current study sought to investigate the relations between DD, appetitive responses, and weight and eating behavior.

Methods: Participants were 107 overweight or obese (BMI 27-45) adults being screened for a behavioral weight loss study. Participants were administered a monetary DD task and a mock taste test as a behavioral measure of disinhibited eating. Self-report measures, including a measure of food responsivity (Power of Food Scale; PFS), were also administered. Results: When controlling for age, IQ, and income, food responsivity (PFS) was a significant moderator of the relations between DD and BMI (B= -.25, F (5,74) = 1.24, p=.04), such that individuals with greater food responsivity and steeper discounting of delayed reward were higher in BMI. Food responsivity was also a significant moderator for the relationship between DD and BMI (B= -.25, F (5,74) = 1.24, p=.04), such that individuals with greater responsivity and steeper discounting of delayed reward were higher in BMI. Food responsivity was also a significant moderator for the relationship between DD and amount of food consumed on the mock taste test (B= -.29, F (5,74) = 1.35, p=.02), such that individuals with greater food responsivity and steeper discounting ate more on the mock taste test.

Conclusions: Results indicate that for those who are highly susceptible to food cues in the environment, practicing delay of reward could be critical for weight control.

T-777-P  Two-Year Changes in Body Mass Index, Waist Circumference and Adiposity in Normal Weight and Overweight Adults
Peter T. Katzmarzyk, Claude Bouchard Baton Rouge, LA

Background: The degree to which changes over time in total body fat and fat stored in specific depots can be predicted from BMI and waist circumference is not clear. The purpose of this study is to compare changes in these measures, including a measure of body composition. A ratio above the median was used to depict a phenotype associated with lower muscularity (LM). Medical records were reviewed for metabolic profile and health status. Results: Ninety-one obese patients (BMI 46.4 ± 7.6 kg/m2; age 57 ± 11 years) were included. The FMI/FFMI ratio was extremely variable ranging from 0.35 to 2.46 kg/m2 and this variability was independent of body weight and BMI. The gender-specific FMI/FFMI ratios were ±0.015 kg/m2 in women, and ±0.78 kg/m2 in men. Plasma albumin concentration was lower in patients with LM compared to their counterparts (p = 0.032). A LM phenotype was the strongest predictor of low back pain (OR = 2.3, 95% CI = 1.01-5.41, p = 0.048). Similarly, the prevalence of alcoholism and sexual dysfunction were significantly greater among patients with LM (p = 0.026 and p = 0.030, respectively). Conclusions: A wide distribution of body composition was observed, independent of BMI. A LM phenotype was associated with higher health risks.

T-779-P  The PNPLA3 NAFLD Risk Allele is Associated with Worsening Liver Histology Following Bariatric Surgery
Sagar Mehta, Peter Benotti, Xin Chu, G. Craig Wood, Anthony T. Petrick, Jon Gabrielsen, William Strodel, David Rolston, Christopher Stull, George Argyropoulos, Glenn Gerhard Davielle, PA

Background: The aim of this study was to determine whether the PNPLA3 NAFLD risk variant was associated with a change in liver pathology in patients undergoing primary bariatric surgery and subsequent revision surgery.

Methods: A retrospective review from September 2002 to January 2012 was performed to identify bariatric surgery patients with paired liver biopsies at the time of initial and revision surgery. Wedge liver biopsy results were reviewed and categorized as normal, steatosis without fibrosis, and any fibrosis. PNPLA3 risk allele was genotyped. Patients with any PNPLA3 risk alleles were compared with patients without any risk alleles.

Results: The PNPLA3 group had worse liver pathology at the time of bariatric surgery. Regardless of genotype, few patients with normal liver at primary surgery had worsening pathology at revision (0% in PNPLA3 group vs 11% in no PNPLA3 group, p=0.999). When limiting to those with steatosis (without fibrosis) at primary surgery (n=7 in both genotype groups), patients without PNPLA3 alleles were more likely to have improved pathology at revision surgery (without PNPLA3: 57% improved, 0% worsened; with PNPLA3: 14% improved, 57% worsened, p=0.047). For those with fibrosis at primary surgery, PNPLA3 was not significantly associated with improvement in liver pathology at revision surgery (67% in PNPLA3 group vs 40% in no PNPLA3 group, p=0.513). Conclusions: In bariatric patients with steatosis, the presence of a PNPLA3 allele was significantly associated with an increased risk of progression of liver pathology despite significant weight loss. This indicates that genetic susceptibility may determine the effect of bariatric surgery on the progression of NAFLD to NASH. Further studies will need to be performed to determine the mechanism of this increased risk.

T-780-P  Psychiatric Disorders and Gestational Weight Gain among Former Smokers
Michele D. Levine, Jennifer D. Slane, Marsha D. Marcus, Melissa A. Kalarchian Pittsburgh, PA

Background: Excessive gestational weight gain (GWG) predicts postpartum weight retention and has a deleterious effect on pregnancy outcomes and neonatal health. Demographic and behavioral factors including prepregnancy weight, lower income, smoking cessation, poor dietary quality and limited...
physical activity have been associated with GWG. However, little is known about the role of psychosocial factors in GWG. We examined the relationship between psychiatric disorders and GWG among pregnant women enrolled in an ongoing trial for postpartum smoking relapse prevention. Methods: Participants, all of whom quit smoking as a result of the current pregnancy (n=111), were interviewed during the third trimester of pregnancy using the Structured Interview for DSM-IV Disorders. Women self-reported height and GWG was calculated from self-reported prenatal weight. Results: On average, women were 25.3±6.0 years old, with a pre-pregnancy BMI of 26.9±7.8. Many (45%) had graduated from high school and 44% were African American. On average, GWG was 15.7±9.6 kg at 36.1±2.2 weeks gestation. Multivariate general linear models controlling for prepregnancy BMI, weeks of gestation, nicotine dependence and income were conducted to examine the relationship between psychiatric disorder and GWG. Meeting criteria for a psychiatric disorder was associated with larger GWG (p<0.01). In addition, lifetime history of anxiety (p=0.001) and bipolar disorder (p =.02) were associated with increased GWG. Conclusions: These data, which require replication in larger samples using measured GWG, suggest that psychiatric disorders, particularly bipolar and anxiety disorder, increase the risk of excessive GWG. Additional research on the role of psychiatric symptoms and psychotropic medications on GWG is needed.

T-781-P Sensory Dysfunction in Adolescents with Co-Occurring Obesity and Chronic Pain
Keri Hansworth, Pippa Simpson, Omar Ali, XueCheng Liu, Lynn M. Rusy, Jaya Varadarajan, Steven Weisman
Milwaukee, WI

Background: Obesity is related to the occurrence of debilitating pain conditions, such as osteoarthritis and fibromyalgia. Although studies of the sensory basis exist for adults, and although obese youth also experience pain conditions, no studies have examined sensory functioning in obese youth. The current study utilized Quantitative Sensory Testing (QST) to examine pain thresholds in youth with obesity alone (O), chronic pain alone (CP), and co-occurring obesity and chronic pain (OCP). Methods: Participants (13-17 years, M 16; 65% Female; 47% African American, 41% Caucasian) were recruited from a pediatric weight management clinic (n=15), and a chronic pain clinic (healthy weight, n=12, overweight/obese, n=19). Patients abstained from analgesics for 24h prior to testing. The testing site was the thenar eminence of the non-dominant hand. Thermal stimulation was delivered by a TSA-II NeuroSensory Analyzer. Each trial began at 32 degrees C, and increased at a rate of 1 degree C/second. Using the method of limits, participants stopped each trial at the point of discomfort. The Heat Pain Threshold (HPT) was defined as the average of 5 trials. Results: Mean HPT for each group was compared with reference values reported for adolescent girls by Blankenburg et al. (2010). Each group differed significantly from the other, and all groups differed significantly from normative levels. Mean values ±SD in order of decreasing sensitivity were: 42.1 ±2.9, 44.3 ±0.5, 45.3 ±3.2, 47.6 ±3.4 for Normal < O < OCP, respectively. 1-tailed p values ranged from <0.2 - .001. Conclusions: This study is the first to provide somatosenory reference values for obese youth and shows that sensory dysfunction may be related to obesity and pain in adolescents. It is critical that we work to understand the sensory mechanisms underlying the pain experience of adolescents.

T-782-P Postprandial Microvascular Dysfunction Is Present in Obese Women
Priscila Maranhão, Maria das Graças C. Souza, Ingrid B. Dias, Diogo G. Panazolzo, José Firmino N. Neto, Luiz Guilherme Kraemer-Aguirau, Eliete Bou skela Rio de Janeiro, Brazil

Background: Postprandial lipemia is related to metabolic and vascular damage. The aim of this study was to assess microvascular reactivity in obese women before and after fat overload. Methods: Of the 37 participants, 19 were obese with BMI of 32.3 ± 1.5 kg/m2 (mean±SD), 30.8 ± 4.7 years and 18 healthy volunteers with BMI of 21.8 ± 1.8 kg/m2, 27.9 ± 5.4 years. Participants had the microcirculation examined by two methods: dynamic videocapillaroscopy using the nailfold bed to assess functional capillary density (FCD), red blood cell velocity in control conditions (RBCV) and peak (RBCVmax) and time (TRBCVmax) to reach it after 1 min arterial occlusion and the finger dorsum to assess FCD. Blood sampling was performed to determine total cholesterol (TC), HDL-c, LDL-c, free fatty acids (FFA), glucose and insulin. Results: After measurements at rest, participants received a fat overload and 30, 60, 120 and 180 min after its ingestion exams were performed again. Obese participants, after meal, presented values significantly lower than at rest with respect to; RBCV (0.30±0.01 vs. 0.29±0.02s; p=0.0005), RBCVmax [0.33±0.02 vs.0.33±0.01s; p=0.0005], HDL-C [51.0±11.0 vs. 47.6±11.1mg/dl; p=0.03], LDL-C [110.8±23.6 vs. 99.3±23.8mg/dl; p=0.0021] and FFA [0.57±0.14 vs. 0.44±0.2mmol/L; p <0.0001] and higher values for: TRBCVmax [5.5±1.3 vs. 6.0±1.4s; p=0.0015], glucose [91.2±15.9 vs. 23.4±15.0umol/L; p<0.0001] and TG [121.4±49.6 vs. 183.2±73.9mg/dl; p=0.0001]. Conclusions: Our results strongly suggest that high fat meal further increases microcirculatory dysfunction and metabolic abnormalities already present in obese women.

T-783-P Third Trimester Cholesterol Predicts Infant Gain in Adiposity During the First 3 Months of Life
Paula C. Chandler-Laney, Joseph R. Biggio, Britney F. Blackstock, Melissa S. Mancuso, Barbara A. Gower
Birmingham, AL

Background: Rapid infant weight gain is associated with greater risk for childhood obesity. However, few predictors of rapid infant weight or body fat gain have been identified. The objective of this study was to test the hypothesis that gestational cholesterol, insulin, or lipid concentrations would be positively associated with infant rate of body fat gain during the first 3 months of life. Methods: Healthy African American women underwent a fasting blood draw to assess lipid profile and a 75-gram oral glucose tolerance test to assess post-challenge glucose response at 32-35 weeks’ gestation. Body composition of infants was measured at 2-weeks (N=27) and 3-months (N=24) by air displacement plethysmography. Results: In simple correlations, maternal post-challenge glucose area under the curve and triglyceride concentrations were associated with infant %fat at 2-weeks (P=0.05), but these associations had diminished by 3-months. Maternal total cholesterol was associated with infant %fat at 3-months (P<0.01). Results of multiple linear regression model showed that maternal cholesterol was associated with rate of infant fat mass gain from 2-weeks to 3-months (partial r = 0.495, P<0.05), independent of infant gender and rate of fat free mass gain. Conclusions: Results extend the existing literature by showing that maternal postprandial glucose in late pregnancy is predictive of adiposity only in the neonatal phase, while maternal cholesterol may be predictive of longer-term susceptibility to adiposity gain during infancy. Although the mechanism for this association is not known, if replicated, these findings may suggest a novel target for intervention during pregnancy to prevent rapid infant body fat gain.

T-784-P Anthropometric Health Risk Stratification in Young Reproductive-Age Females
Lorraine M. Lanningham-Foster, Randall Foster Ames, IA

Background: Individuals with a normal body mass index (BMI) and excessive body fat (normal weight obesity) may be at greater metabolic risk. The purpose of the study was to compare various anthropometric markers for health (BMI, waist circumference, hip circumference, and body fat percentage) in young reproductive-age females. Methods: Forty-seven young women (age 24 ± 5 years, BMI 21.7 ± 2.5 kg/m2) had anthropometric values measured by trained staff according to NHANES III procedures (height, weight, waist and hip circumferences). Body composition was measured using bioelectrical impedance analysis (BIA). The “Healthy” stratification criteria were: BMI (18.5 – 24.9 kg/m2), waist circumference (WC, ≤ 77 cm), waist:hip ratio (WHR, ≤ 0.85), and body fat percentage (BF%, 12-32%). Using these criteria, each mode was examined using contingency analysis, and ROC curves were created to find more accurate stratification criteria for this sample, using BF% as a reference standard. Current and novel criteria were analyzed using Chi square tests. Results: Body fat measures stratified 39 of the women into the “Healthy” group and 8 into the “At Risk” group. BMI, WC, and WHR measures agreed significantly with BF%’s stratification into the “Healthy” and “At Risk” groups: BMI 38 “Healthy” and 3 “At Risk” agreed, P=0.471, P < 0.005, WC 39 and 3 agreed, P=0.577, P < 0.0001, WHR 29 and 6 agreed, P=0.391, P < 0.01. In this pool, the Matthews Correlation Coefficient (TRBCVmax) was optimal at 0.24 kg/m2, which, at a circumference ≤ 82 cm (BMI 36 and 6 agreed, P= 0.643, P < 0.0001, WC 35 and 6
agreed, \( P_h = 0.595, P < 0.0001 \). Conclusions: Health risk stratification may be improved by further optimization. A combination of measures and an adjustment of the stratification criteria may provide more accurate and informative anthropometric markers, especially in women.

**T-785-P**  
Subjective and Objective Methods to Examine Sleep Amount in Free-Living Families  
Shiny Parsai, Randal Foster, Lorraine M. Lanningham-Foster Ames, IA

**Background:** Obesity and sleep insufficiency appear to be linked, possibly due to excess energy intake during wake time contributing to weight gain. To better understand the relationship between insufficient sleep and obesity, we need accurate and practical tools to quantify sleep. The purpose of this study was to compare two objective tools and one subjective tool to study sleep in free-living families. **Methods:** The study included 18 families (10 men, 17 women, 11 boys, and 5 girls). Participants participated in a week-long study to monitor their sleep using an accelerometer (MSR145), a pattern-recognition system (SenseWear WMS® Mini armband), and sleep logs. BMI was calculated using height and weight and body composition was measured using air displacement plethysmography (BOD POD®). The objective tools were compared to the sleep log using regression analyses. Post-hoc tests were used with ANOVA and ANCOVA with a Bonferroni correction applied to provide an overall significance level of \( P < 0.05 \). **Results:** The objective tools estimated similar sleep duration data from the subjects when compared with the sleep log. The accelerometer had a better correlation than the pattern-recognition system when compared with the sleep log. The accelerometer had a better correlation than the pattern-recognition system when compared with the sleep log. Sleep duration was inversely correlated with age for all measurement tools. **Conclusions:** Future additional studies targeting free-living families to study sleep amount and obesity using these objective tools would be beneficial. It is also possible that the relationship between sleep duration and obesity may be explored in existing data sets where these objective measurement tools have been employed for other purposes such as physical activity assessment.

**T-786-P**  
Associations of Infant Feeding Practices with Change in Infant Percent Fat  
Desti N. Shepard, Britney F. Blackstock, Joseph R. Biggio, Paula C. Chandler-Laney Birmingham, AL

**Background:** Feeding practices may be important determinants of infant weight gain, and rapid infant weight gain is associated with childhood obesity. Feeding on a schedule, as opposed to on-demand feeding, and the use of food to soothe an infant are practices that may undermine an infant’s ability to self-regulate intake, and therefore may contribute to excess weight gain during infancy. The objective of this study was to test the hypotheses that scheduled feeding and the use of food to soothe an infant are associated with greater infant total %fat gain during the first 3 months of life. **Methods:** Twenty-three African American mothers completed The Infant Feeding Practices questionnaire to assess scheduled feeding and the use of food to soothe the infant at 2-weeks of age. Infant body composition was measured at 2-weeks and 3-months by air displacement plethysmography. Associations between feeding practices and infant total body %fat were assessed with simple and partial correlations. **Results:** Scheduled feeding and the use of food to soothe were not associated with infant %fat at 2-weeks of age. In separate analyses, scheduled feeding (\( r = 0.42, P = 0.05 \)) and the use of food to soothe the infant (\( r = 0.43, P = 0.05 \)), were associated with infant %fat at 3-months of age after adjusting for %fat at 2-weeks. **Conclusions:** In this cohort of predominantly formula-fed infants, feeding on a schedule and the use of food to soothe the infant was associated with greater body fat gain. It is not known whether these same associations are found among breast-fed infants. Future follow-up with this cohort will examine whether these feeding behaviors are associated with body weight gain into early childhood.

**T-787-P**  
Atherogenic Risk in Obesity Phenotypes in Black and Hispanic Adolescents  
Unab Khan, Judith Wylie-Rosett, Robert Kaplan, Meredith Hawkins Bronx, NY

**Background:** In adults, obesity phenotypes, based on insulin resistance, show a difference in cardiovascular disease (CVD) risk marker levels, and atherosclerosis. We examine these differences in obese insulin sensitive (obese-IS) and insulin resistant (obese-IR) black and Hispanic adolescents. **Methods:** A prospective study comparing anthropometrics, blood pressure, lipids, glucose and intima media thickness [in common carotid (CCA-IMT), internal carotid (ICA-IMT), & carotid bulb (bulb-IMT)]. Using HOMA values from 300 obese adolescents, we categorized subjects as obese-IR if in the highest HOMA tertile (≥ 4.39) and obese-IS if in the lower two tertiles. T-test and chi-square to compare differences between obesity phenotypes. Linear regression models are constructed to examine associations of carotid artery segments with CVD risk markers and obesity phenotypes. **Results:** To date, 66 of 200 adolescents (61% female; 58% Hispanic, 42% black; age: 14.2 ± 1.8 yrs.; 31 obese-IR and 35 obese-IS) have completed baseline evaluation. Obese-IR group is heavier (BMI: 38.3 ± 7.3 vs. 34.9 ± 4.7; p: 0.03) and has a higher triglyceride levels (86 ± 40 vs. 64 ± 20; p: 0.02). There are no differences in IMT between the phenotypes. ICA-IMT is associated with age (β: 0.01; 95% CI: 0.002, 0.02; p: 0.014), black race (β: 0.047; 95% CI: 0.019, 0.075; p: 0.001), and HDL-C (β: 0.005; 95% CI: 0.0005, 0.01; p: 0.03) but not with obesity phenotypes. **Conclusions:** Black race associated with increased ICA-IMT regardless of obesity and obesity phenotype. Absence of differences in IMT measures between obesity phenotypes cannot be commented on due to low sample size at present.

**T-788-P**  
A Pathogenic or Protective Role for BMAT During Growth-Obesity May Be the Director  
Krista Casazza, Lynae J. Hanks, Anna L. Newton, Stephenie Wallace Birmingham, AL

**Background:** While pathogenic attributes of bone marrow adipose tissue (BMAT) described in the older adult population could contribute to the prominent sequelae of various chronic diseases its appearance in long bones during arguably the most critical period in skeletal and metabolic programming (i.e., puberty) challenge this notion. The objective of this study was to test the hypothesis that obesity accelerates the size of the marrow compartment at the expense of quality components of bone, ultimately compromising bone material properties and structural design. Further, as muscle and bone adapt in parallel we also aimed to evaluate qualitative and quantitative aspects of skeletal muscle and the relationship with BMAT. **Methods:** Subjects were 46 overweight/obese girls age 7-12 years. Bone and muscle parameters were evaluated by MRI, pQCT and DXA and associations were tested by partial correlation. **Results:** BMAT was positively associated with quantitative aspects of bone and muscle (i.e., greater bone mineral content and density). However, bone marrow density, a representation of hematopoietic capacity and thus qualitative attribute of the composite bone, was inversely associated with cortical bone density and marginally inversely associated with cortical bone area. Further, muscle density was positively associated with quantitative aspects of bone and muscle, yet any association with qualitative skeletal measures was not detected. **Conclusions:** During puberty, obesity may negatively influence musculoskeletal development. The inverse association between cortical bone attributes and marrow density, while seemingly counterintuitive represent a chronology associated with progressive bone development. In obesity accelerated periosteal expansion occurs at the expense of coupling processes required to support quality of bone.

**T-789-P**  
Systematic Review of Clinical Studies Related to Pork Intake and the Risk or Management of Diabetes, Metabolic Syndrome or Its Components  
Nicolas Stettler, Mary M. Murphy, Leila M. Barraj, Kimberly M. Smith Washington, DC; Rexford S. Ahima Philadelphia, PA

**Background:** Globally, both the incidence of type 2 diabetes and the consumption of pork have increased significantly. Processed meats, which include many pork products, have been associated with an increased risk for
diabetes in observational studies. The goal of this systematic review was to assess experimental human studies of the impact of pork intake, compared to other protein sources, on early markers for the development of diabetes: insulin resistance, glucose intolerance, and components of the metabolic syndrome. Methods: Systematic review searching PubMed and EMBASE and using the Cochrane and PRISMA guidelines. Results: 8 studies were eligible and critically reviewed. 5 were based on a single meal / day exposure to pork, compared to other protein sources. The glucose-insulin response after pork did not differ from beef, shrimp, or mixed sources of protein. However, as compared to other protein (processed) led to a larger insulin response, and, as compared to whey, led to a smaller insulin response and a larger glucose response. This glucose response suggests a possible mechanism for the association between processed meat and diabetes. Non-processed pork was not compared to eggs or whey. The 3 longer interventions (11 d - 6 m) with mostly non-processed pork did not show a significant impact of pork consumption on components of the metabolic syndrome, with the exception of a possible benefit on waist circumference and HDL cholesterol (one study each, with significant limitations). Conclusions: In general, the literature on the topic is limited and important research gaps exist to clarify a possible link between pork meat intake and diabetes. Considering recent trends and projections for diabetes and pork intake, this is an important global public health question that requires more attention in order to provide improved evidence-based dietary recommendations.

T-790-P
Changes in Food Intake After Short-Term Anorexiant Administration Use Predict Later Weight Loss
Laurel Mayer New York, NY; Bjorn Carlsson, Cecilia Karlsson Molndal, Sweden; Carla Wolper, Simona C. Kaplan, Julia Weigel, Juli A. Goldfein, Richard Foltin, B. Timothy Walsh, Rudolph Leibel New York, NY
Background: Few reliable predictors of weight loss exist. We aim to examine whether short-term anorexiant administration is associated with changes in food intake, and if those changes are predictive of later weight loss. Methods: Healthy, obese (BMI between 30-40kg/m²) individuals were recruited for a double-blind, crossover, medication study followed by open treatment. Participants were randomized to one week of medication (37.5 mg phentermine) and placebo. At the end of each week, as part of a larger protocol, participants were fed a laboratory lunch meal. Gram weight and kcal were calculated for all food consumed. Upon completion of the testing procedures, participants were offered 6 months of phentermine and behavior-assissted weight loss. Weight lost and rate of weight loss were determined. Data were analyzed using SPSS (IBM Corp, version 20). Results: Participants were 7 women and 1 man, with a mean(±SD) age of 45±15 years and a mean BMI 35.80±2.9 kg/m². Mean intake at the laboratory meal was 830±680 kcal on phentermine and 870±459 kcal on placebo. For some patients meal intake was greater on phentermine compared to placebo, thus full interpretation of the mean intake is limited. Two participants have completed, and six remain in active weight loss. Mean number of weeks completed to date is 15±7 weeks, and mean total weight loss is 7.6±3.4 kg. Rate of weight loss is -0.64±0.43 kg/wk. The correlation between the drug-placebo difference in food intake and rate of weight loss was r=0.83 (p<0.013). That is, the larger the decrease in meal intake between placebo and drug conditions, the greater the rate of weight loss during treatment. Conclusions: After only 1 week of administration of an anorexiant (phentermine), significant changes in food intake can be detected, and the magnitude of those changes is strongly correlated with subsequent weight loss.

T-791-P
Arterial Elasticity Predicts Central and Subjective Fatigue in Overweight Older Women
Background: Obesity is associated with reduced arterial elasticity (AE), which itself increases risk for cardiovascular disease. Reduced AE may also contribute to fatigue, particularly during exercise, by impairing circulation and delivery of nutrients to the brain. The purpose of this study was to determine whether AE is related to central and subjective fatigue. Methods: Subjects were 91 overweight women aged 56+6 years (BMI = 27.2±4.4, % Fat = 42.8 ± 6.0) without diagnosed health conditions. Large vessel AE was deter-

mined using non-invasive radial artery pulse wave analysis over the brachial artery and based on the modified Windkessel model. Central fatigue was measured during two 30 repetition isometric tests for the knee extensor muscles and defined as a ratio between maximum voluntary contraction and maximum voluntary contraction with simultaneous fatigue of 0.6. Subjective fatigue was assessed using questions about “loss of energy” and “tiredness or fatigue” from the Beck Depression Inventory. Multiple regression was used to evaluate AE relationships with fatigue measures, adjusted for confounders. Results: Large AE was inversely associated with central fatigue (partial r = -0.42, p=0.01) after adjusting for age (partial r = -0.29, p=0.002). Conclusions: AE is independently related to fatigue in this sample of older overweight women. This is especially apparent in the central nervous system where AE is independently related to perceptions of fatigue at rest and central fatigue during 30 maximal contractions. These results suggest arterial health may be involved with central fatigue and subjective fatigue in overweight women, independent of other known predictors.

Friday, November 15, 2013
Posters on Display: 10:00 AM - 3:30 PM
Location: Exhibit Hall A

Population Based Intervention Studies

T-792-P
DietBet, Inc: Web-Based Social Gaming and Financial Incentives for Weight Loss
Tricia M. Leahy Providence, RI; Jamie Rosen New York, NY
Background: Web-based commercial weight loss programs are increasing in popularity. Despite their significant public health potential, there is limited research on the effectiveness of such programs. This study examined weight loss produced by DietBet.com and explored whether baseline variables and engagement parameters predicted weight outcomes. Methods: DietBet.com is a social gaming website that uses financial incentives and social influence to promote weight loss. Players bet money and join a game. Games consist of 2 or more players. All players have 4 weeks to lose 4% of initial body weight. At enrollment, players can choose to share their participation on Facebook. During the game, players interact and report weight losses on the DietBet platform. At game end, those who lose 4% are declared winners and split the pool of money bet at game start. Official weigh-in procedures are used to verify weights at game start and game end. Results: From December 2012 to April 2013, 25,808 players (83% Female; 89.1% ≥ 50) completed 1,356 games. Average amount bet was $226±27. A total of 90% completed. Mean weight loss was 3.1±2.0%. Those who won their game (N=11,355) lost 6.0±4.2 and lost 4.9±1.0% of initial body weight, with 31% losing ≥5%. Betting more money, sharing on Facebook, completing more weigh-ins, and having more social interactions during the game predicted greater weight loss and greater likelihood of winning (p<.001). In addition, weight loss clustered within games (p<.001), suggesting that players influenced each others’ weight outcomes. Conclusions: DietBet.com, a social gaming website, reached over 25,000 individuals in just 5 months and produced excellent 4-week weight losses. Given its potential public health impact, future research may consider examining whether a longer program further enhances weight outcomes.

T-793-P
Psychosocial Status in Relation to Ethnic Differences in Weight Loss of Severely Obese Women: The Heads Up Project
Robert L. Newton, Meredith E. Shapiro, William D. Johnson Baton Rouge, LA; Valerie Myers Golden, CO; Philip J. Brantley Baton Rouge, LA
Background: Examined potential ethnic differences in associations between psychosocial indices and weight loss following a 16-week very low calorie diet. Methods: Participants were women (n = 134; mean BMI = 46.5; mean age = 50.0; 47% African American, AA) insured by the Louisiana Office of Group Benefits, a state-managed health insurer and sponsor of this study. Participants completed the Impact of Weight on Quality of Life (IWOQL), Questionnaire on Eating and Weight Patterns, Eating Inventory, and Beck Depression Inventory-II before enrolling in a 16-week low calorie diet program. Results: AA women scored higher on all IWOQL subscales and the total score (p values < 0.05) compared to Caucasian (CA) women, indicating
poorer quality of life. AA women also displayed higher levels of restrained eating (p < 0.001), and CA women displayed greater levels of disinhibition of eating and hunger (p values < 0.001). Binge eating and bulimic symptomatology were greater (p values < 0.001) in CA compared to AA women with a BMI < 45 vs. 45+ for women aged < 45 with a BMI < 45 tended to lose less weight (p=0.09), regardless of age. Regression analyses revealed that greater weight loss in the initial two weeks and lower scores (better quality of life) on the IWQOL self-esteem subscale (p values < 0.039) were associated with more weight loss in AA women, while only initial weight loss was associated with weight loss in CA women (p = 0.047).

Conclusions: Findings reveal ethnic differences in psychosocial responses and weight loss that are dependent on age and degree of obesity. Obesity researchers may find it productive to address the etiology of these differences as this may enhance future weight loss efforts.

T-794-P
Improved 3D Stimuli: A Novel and Innovative Approach to Perceptual Body Image Assessment
Stephen Wohlgemuth, Ninoska D. Peterson Norfolk, VA
Background: Examining body image in obese patients is challenging with current measures. Perceptual body image has traditionally been assessed using singular shape, two dimensional drawings scaled between very thin to very obese figures that do not accurately reflect varied body shapes of people. This lack of shape variety makes it difficult for the subject to objectively associate her or his perceived body shape within the given figural stimulus range. The current study creates an accurate and representative body shape scale and a series of figural stimuli for an obese population using cutting-edge technology.

Methods: 500 morbidly obese bariatric surgical candidates were scanned using a 3D body scanner (Mean age = 42.5, Mean BMI = 46, Mean waist circumference = 48 inches, Mean waist-to-hip ratio = 0.85) Body volume, surface area and body shape were derived from the 3D scans. Subtraction algorithms and predictive modeling were used to create 3D models based on the preoperative scans that predicted a patient’s appearance after various amounts of weight loss. Results: A mathematical Shape Descriptor formula was used to generate seven shapes: Hyper-Gyneocod, Gyneocod, Mixed Gyneocod, Mixed, Mixed Android, Android and Hyper-Android. These shapes have unique characteristics that make them easily identifiable, and each shape has its own subsequent underlying range of figures, thus creating a new set of scaled figural stimuli more identifiable to patients.

Conclusions: Seven key shapes have been statistically generated to create an assessment tool that more accurately represents body types. This new scale demonstrates promise as a clinical screening measure for assessing perceptual body image. It also may provide patients with a clearer idea of corresponding weight loss and weight gain for their individual body shape. Further psychometric evaluation is warranted.

T-795-P
Impact of a Multi-Level, Cluster-Randomized Environmental Obesity Intervention for Youth in Baltimore City
Elizabeth Anderson Steeves, Abyangun Shin, Anastasia Coutinho, Joel Gittlesohn Baltimore, MD
Background: Obesity rates among low-income, minority youth are disproportionately high. Methods: Baltimore Healthy Eating Zones (BHEZs), a multi-level, cluster-randomized environmental obesity intervention targeted low-income, urban, African American youth ages 10-14. The intervention included environmental changes in small stores and carry-out restaurants as well as programming delivered in recreation centers by study staff and peer educators, in efforts to promote achievement of a healthy weight status among youth. Results: Initial results of the BHEZ intervention were promising, with a 2.23 percentile reduction (p=0.04) in BMI seen in youth who received the intervention and no significant difference in BMI percentile among comparison youth. Further sub-group analyses revealed that select sub-groups of the intervention sample drove the reduction in BMI, while other sub-groups had no reduction in BMI. The intervention had the biggest impact on girls with BMIs above the 85th percentile at baseline (n=28, reduction in BMI percentile -3.16, p=0.03), with the strongest effects seen in girls with BMIs above the 85th percentile who received high exposure to the intervention (n=2, reduction in BMI percentile -3.10, p=0.01). The BHEZ intervention did not significantly impact the BMI percentiles of the majority of the intervention sample, including normal weight and overweight boys or normal weight girls. Conclusions: Reviewing BHEZ impact findings provides insight on the weaknesses of the intervention (for example, differing levels of intervention exposure among the measurement sample) and opportunities for scaling up multi-level approaches in future studies. The positive strategies identified in the review of the BHEZ intervention will be incorporated into our new trial, B’More Healthy Communities for Kids.

T-796-P
Placement Strategies to Enhance the Sale of Healthier Products in Supermarkets in Low-Income, Ethnically-Diverse Neighborhoods: A Randomized Controlled Trial
Background: The greater presence of supermarkets in low-income, high minority neighborhoods has the potential to positively affect diet quality among those at greatest risk for obesity. Little research has evaluated the effects of in-store placement strategies on the sales of healthier items in these areas. We evaluated the effects of in-store marketing strategies to promote the purchase of specific healthier items in supermarkets. Methods: This was a cluster randomized controlled trial conducted from 2011-2012. Eight urban supermarkets in low-income, high-minority neighborhoods were the unit of randomization, intervention, and analysis. Stores were matched on percent of subsidized food sales and store square footage, and randomly assigned to Intervention or Control. Intervention stores (n = 4) employed in-store marketing strategies focused on increasing product availability and providing optimal placement in five food and beverage categories: (milk, ready-to-eat cereal, frozen meals; in-aisle beverages; checkout beverage coolers). The intervention lasted six months. Control stores (n = 4) served as assessment-only controls. The main outcome measure was store-level weekly sales data for each of the targeted products. Results: Intervention stores showed significantly greater sales of skim and 1% milk, water (in aisle and at checkout) and selected frozen entrees than did control stores. There were no differences between the stores in cereal, soft drinks or diet soft drinks. Conclusions: These data suggest that straightforward placement strategies can significantly enhance the sales of healthier items in several food and beverage categories. Such strategies should promise for significant public health impact in communities at most risk for obesity.
these findings may help further AS research in that fingerstick b13C value can be a minimally invasive, low-burden method of assessing AS intake in community settings. Thus, associations of b13C value to overall dietary quality and USDA adherence may be assessed.

T-799-P
Effect of Menopause Transition on Muscle Fat Content: A MONET Group Study
Joseph Abdalnour, Eric Doucet Ottawa, Canada; Isabelle J. Dionne, Martin Brochu Sherbrooke, Canada; Jean-Marc Laviose, Remi Rabasa-Lhoret Montréal, Canada; Denis Prud’homme Ottawa, Canada
Background: High muscle fat content and area of low muscle density have been associated with cardiometabolic deterioration in both lean and obese women. Purpose: To investigate intra-muscular adipose tissue (IMAT) and muscle density in women going through menopausal transition. Methods: Statistical analyses were performed using data of 102 healthy premenopausal women (age: 49.9±1.9 y; BMI: 23.3±2.2 kg/m2) who participated in the MONET (Montreal, Ottawa, New Emerging Team) study on the effect of menopausal transition on body composition and cardiovascular risk factors. Outcomes: IMAT, subcutaneous adipose tissue (ScAT) and the areas of muscle density of the thigh were measured by CT scan, fasting plasma lipids, glucose and insulin levels, HOMA-IR and VO2 max. Results: Repeated measures ANOVA revealed significant increases for IMAT (20.7±7.5 to 32.2±9.7 cm2; P<0.001) and the area of low muscle density (42.7±9.3 to 55.8±10.0 cm2; P<0.001), as well as a significant decrease for the area of high muscle density (167.0±23.5 to 142.9±22.5 cm2; P<0.001) between year 1 and year 3. Also, a significant effect for “menopausal status” was observed for the area of high muscle density (premenopausal: 162.3±18.9 cm2; perimenopausal: 153.8±20.3 cm2; postmenopausal: 143.9±18.9 cm2; P<0.05). After adjusting for VO2 peak, the effect of “time” and “menopausal status” were no longer significant for the area of low muscle density and the area of high muscle density respectively. Finally, no correlation was observed between changes in muscular fat content or low muscle density with changes in cardiometabolic markers. Conclusions: Our results suggest that women going through the menopause transition showed increased muscle fat content. However, changes were not accompanied by cardiometabolic deteriorations in our population.

T-800-P
Effect of Treatment Regimen on Weight Loss in Response to Energy Restriction in Patients with Type 2 Diabetes (T2DM): Lessons from the Ottawa Hospital Weight Management Clinic (OHWMC) Database of 3314 Patients
Robert Dent, Mary-Ellen Harper, Ruth McPherson, Majid Nikpay Ottawa, Canada
Background: Treatment of patients with T2DM with insulin or insulin secretagogues is commonly associated with weight gain but it is not known if these agents alter the response to dietary restriction. Methods: The OHWMC is a year-long behavioral program for the treatment of obesity which uses the Optifast 900* meal replacement for the first 6-12 wks. From 1992 to 2009, 3,314 (P = 2407) were treated with this standard protocol and data captured on all participants (Dent et al 2002). We compared the rate of weight loss in the first 6 wks of Optifast 900* meal replacement as described previously (Harper et al2002; Gerrits et al, 2010) for 4 groups of subjects: A) patients without diabetes, n=2,197 B) impaired fasting glucose, n=90 C) patients with DM2 treated with no medication or with metformin and/or acarbose, n=188 D) Patients with DM2 treated with insulin and/or SUs, n=290 BMI, initial weight and rate of weight loss were adjusted for the effect of sex and age. Results: Results: Initial weight, BMI and age were similar among groups B, C and D but lower for group A (P < 4 x 10-5). The rate of weight loss for groups A, B and C were not different. However, group D patients lost weight significantly more slowly as compared to group A (P < 0.0075). Conclusions: Conclusions: Treatment of patients with T2DM with insulin or insulin secretagogues may impair weight loss response to energy restriction.

T-801-P
Patterns of Food Consumption Are Related to Obesity and Self-Reported Diabetes and Cardiovascular Disease in Five American Indian Communities
Joel Gittelsohn Baltimore, MD; Angela Trude São Paulo, Brazil; Brittany A. Jock Baltimore, MD; Paula A. Martins São Paulo, Brazil; Jacqueline G. Swartz, Marla Pardilla Baltimore, MD
Background: Relationships between dietary patterns and chronic disease are underexplored in American Indian (AI) populations. We examined the relationship between patterns of food consumption and obesity, self-reported diabetes, hypertension and cardiovascular disease in five rural AI communities in New Mexico and Michigan. Methods: Patterns of consumption were estimated using a food frequency questionnaire of 45 commonly eaten foods (n=424 AI adults). Four food scales were identified through factor analysis: Healthy Foods (low sugar cereals, vegetables, fruits), High-Fat Foods (hot dogs, fried potatoes, fried eggs), Animal Flesh foods (chicken, game meat, fish), and Unhealthy Snacks (candy, chocolate, chips). Results: The majority of participants were obese (63.6%) or overweight (30.0%). Diet characterized by greater consumption of high fat foods, animal flesh foods were associated with a greater risk for cardiovascular disease (ORhigh fat foods = 4.28, CI=1.84-9.90), ORanimal flesh food= 2.84, CI=1.30-6.18) and diabetes (ORhigh fat foods = 10.12, CI=2.19-46.71, ORanimal flesh food= 4.03, CI=1.03-15.70). Unhealthy snacks were highly associated with increased risk for cardiovascular disease (ORunhealthy snacks = 5.84, CI=1.46-23.33), but with decreased risk for obesity (ORunhealthy snacks = 0.41, CI=0.17-0.96). Conclusions: Specific patterns of food consumption are related to chronic disease in AI communities. This information has been incorporated into an ongoing obesity and chronic disease prevention program.

T-802-P
An Innovative Weight Loss Program for Adolescents with Intellectual and Developmental Disabilities
Lauren T. Pomey, Jeannine R. Goetz Kansas City, KS; Janehoo Lee Lawrence, KS; Debra K. Sullivan, Joseph E. Donnelly Kansas City, KS
Background: Adolescents with intellectual and developmental disabilities (IDD) are at an increased risk of obesity with up to 55% considered overweight and 31% obese. Yet, there has been minimal research on weight management strategies for adolescents with IDD. The purpose of this study was to compare the effectiveness of two weight loss diets, an enhanced Stop Light Diet (eSLD) and a conventional diet (CD) diet, and to determine the feasibility of using tablet computers as a weight loss tool in overweight and obese
adolescents (11-18 yrs.) with IDD. Methods: A 2-month pilot intervention was conducted. Participants were randomized to either the eSLD or CD, and were given a tablet computer with diet applications, which they used to track daily dietary intake and physical activity. They met weekly with a health educator via video chat on the tablet computer. Participants on both diets were able to lose weight, and there were no significant differences between the eSLD and CD (-4.6 ± 2.1% vs. -3.3 ± 2.2%; respectively p = 0.13). There was a significant decrease in sedentary activity time (p = 0.0280) and energy intake (p = 0.0001) in both groups. Participants tracked their dietary intake 83.4 ± 21.3% of possible days, physical activity 60.0 ± 34.3% of possible days, and attended an average of 80.0 ±19.6% of video chat meetings. All participants reported enjoying the use of the tablet computer and applications, and 95% reported they were “easy” to use.

Conclusions: Both dietary interventions appear to promote weight loss in adolescents with IDD, and the use of tablet computers appears to be a feasible tool to deliver and monitor a weight loss intervention in adolescents with IDD.

T-803-P
The Role of Peer Eating and Physical Activity in the Prevalence of Obesity among Appalachian Children
Liang Wang, Jodi Southerland, Deborah L. Slawson, Diana Mozen Johnson City, TN

Background: Diet and physical activity (PA) are established risk factors of childhood obesity, but few studies have examined the influence of social support for healthy eating and PA on the prevalence of obesity among Appalachian children. Methods: Waves 1 (n=544) and 2 (n=965) baseline data collected between 2011-2012 were used from the Team Up for Healthy Living Project, a cluster-randomized trial targeting obesity prevention in adolescents through a cross-peer intervention among Appalachian school children. Adolescents completed a survey battery including the Index of Social Support for Healthy Eating and the Social Support for Physical Activity measure. Height and weight were also measured using a standard protocol. Multiple logistic regression was used for analysis, adjusted for sex, race, parents’ education level, family income, and school characteristics. Results: Greater social support for PA rather than for healthy eating was associated with a lower prevalence of childhood obesity (OR=0.95, 95% CI=0.93-0.97). However, when stratified by sex, only male children with increasing support for PA were less likely to be obese (OR=0.92, 95% CI=0.90-0.95). Conclusions: Support for PA was associated with a lower prevalence of childhood obesity in the present sample. Strategies targeting increasing family and peer support for PA may be an effective method for reducing obesity rates particularly among male children. However, further longitudinal studies are warranted to examine the long-term effect of support for PA on the risk of childhood obesity.

T-804-P
Determining the Effectiveness of a National Weight Loss Program Over Seven Years
Nia S. Mitchell, Brenda Beaty, Arianna F. Nassel. Aurora, CO

Background: Take Off Pounds Sensibly (TOPS) is a national, nonprofit, low-cost weight loss program. We analyzed data from all TOPS members in the US to determine the real-world effectiveness of the program over seven years. TOPS participants renew their memberships annually. The primary aim was to determine weight change among US TOPS members who remained in the program for at least one year. The secondary aim was to determine yearly retention. Methods: Study participants were those aged 18 and over who joined TOPS from Jan. 1, 2005 to Dec. 31, 2011. There were 213,356 eligible participants, and they were analyzed for each renewal. Data were analyzed using mixed-effects repeated measures models with individual random intercepts. Results: The number of participants by years of renewal is as follows: 1 yr, N = 72,717; 2 yrs, N = 36,870; 3 yrs, N = 21,062; 4 yrs, 12,396; 5 yrs, N = 7,379; 6 yrs, N = 4,291; and 7 yrs, 2,323. The mean weight change as a percentage of initial weight by years of renewal is as follows: 1 yr, -5.9%; 2 yrs, -6.9%; 3 yrs, -7.1%; 4 yrs, -7.3%; 5 yrs, -7.6%; 6 yrs, -8.0%; and 7 yrs, -8.2%. The percentage of participants whose weight loss was ≥5% of initial weight at each interval is as follows: 1 yr, 49%; 2 yrs, 55%; 3 yrs, 56%; 4 yrs, 58%; 5 yrs, 60%; 6 yrs, 62%; and 7 yrs, 62%. The retention by years of renewal is as follows: 1 yr, 34.1%; 2 yrs, 19.5%; 3 yrs, 13.0%; 4 yrs, 9.4%; 5 yrs, 7.3%; 6 yrs, 6.1%; and 7 yrs, 6.3%. Conclusions: Individuals who participated in TOPS for at least one year lost a significant amount of weight and those who remained in the program maintained the weight loss for up to seven years. This degree of weight loss is clinically important and is comparable to more expensive commercial weight loss programs. The retention in TOPS is higher than published results for a more expensive national commercial program.

T-805-P
Effects of Short-Term Resistance Training Program on Vascular Reactivity in Obese Non-Diabetic Adolescents

Background: Aerobic exercise is considered an effective tool for the improvement of forearm blood flow (FBF) and vascular conductance (VC) in healthy subjects helping to prevent cardiovasculardiseases. However, effects of isolated resistance training exercises (RT) are still unclear in obese adolescents. Methods: We have aimed to evaluate the effects of RT on vascular reactivity in obese non-diabetic adolescents. The intervention was performed three times/week solely with RT during three months, including 24 sedentary obese non-diabetic adolescents (17 girls/7 boys; 14.1±1.0 y; 87.8±11.3 Kg; 32.1±3.6 kg/m2; Z-IMC 2.6±0.3). Venous occlusion plethysmography was used to assess muscular FBF at resting and after 3 min ischemia (post-occlusive reactive hyperemia – PORH). FBF was normalized to flow per unit of blood pressure (forearm VC) as follows: VC = (FBF/mean blood pressure) X 1000. All volunteers were evaluated before and after RT. Results: No change in body mass (87.8±11.3 vs. 87.2±11.5 Kg, NS) was observed after the isolated and regular RT program, but improvements on VC at resting (18.3±13.0-24.8±8.2) vs. 25.2±16.3-37.3±3.7 FBF/mmHg; P<0.05), during PORH (45.2±31.7-54.5±6.4±39.1±8.40 FBF/mmHg; P<0.05) could be observed. Conclusions: Our results suggest that a 3-month program solely of RT could improve vascular reactivity, independently of weight loss in obese non-diabetic adolescents.

T-806-P
Who Loses Weight in MOVE? Lifestyle Change in a Large National Healthcare System
Sandra L. Jackson, Mary Rhee, Solveig A. Cunningham, Darin E. Olson, Christine Jasion, Phyllis Watson-Williams, Anne Tomolo, Lawrence S. Phillips. Atlanta, GA

Background: Most studies of lifestyle change have utilized subjects who “volunteered,” but little is known about the outcomes that can be obtained within healthcare systems – where participation is “recommended” by providers. The VA’s MOVE program (Managing Overweight and/or Obesity for Veterans Everywhere) is the largest lifestyle change program in the US, with over 400,000 participants since 2005. Methods: We used the VA Informatics and Computing Infrastructure (VINCI) to examine patients who would be eligible: obese (BMI ≥30) or overweight (BMI ≥25) with a weight-related health condition; ≥3 years of outpatient care in the VA between 2005-2012; age 18-75; and with no acute or chronic exclusionary conditions. We compared 285,460 participants and 2.2 million nonparticipants who met these criteria. Results: Participants were more likely than nonparticipants to be female, African American, have service-connected disabilities, have co-morbidities, and live closer to facilities offering MOVE. Participants were also more likely to take medications for weight loss, take medications with a risk of weight gain, and had more visits/year in the VA system. Veterans who had “intense and sustained” participation (≥8 sessions within 6 months, and ≥129 days between first and last sessions) had significantly greater weight loss at 3 years than less-active participants and nonparticipants (-2.3% vs. -0.68% and +0.26, respectively, p<0.01). Among patients without diagnosed diabetes at baseline, greater weight loss at 6 months was associated with less risk of incident diabetes over 3 years (p<0.01). Conclusions: The VA’s MOVE program demonstrates that weight loss can be achieved in a large scale healthcare setting. Further research is needed to determine the impact on veterans’ health and the VA health system, and how best to encourage active participation.
The Impact of a 12 Week Lifestyle and Diet Intervention Program on African American Women
Tiffani L. Grant Canton, MS; Jacinda Roach Madison, MS

Background: Mississippi has historically led the nation in obesity rates. African American women represent a subgroup of the population in the state that ranks the highest for obesity. Mortality rates due to heart disease and hypertension indicate significant health disparities for this subgroup. Methods: The Healthy Families Movement (HFM) was designed to address the population’s major modifiable risks for heart disease and obesity. One hundred and thirty participants worked with a physician, dietitian, personal trainer and behavioral health specialist to develop and adhere to individualized wellness plans through the twelve-week program. The program incorporated nutrition counseling, increased physical activity and stress management weekly. Training in deep breathing, guided imagery, journaling and coping skills was provided to participants using the Bright Futures Guide to Emotional Wellness (US HRSA). Extensive support including one-on-one with a provider, cooking classes, grocery store tours, family activities and case management assisted participants in achieving and maintaining goals. All participants (n=130) completed a nutrition knowledge questionnaire, a perceived stress survey and a fitness test initially and at program conclusion. Weights were also measured at these intervals. Results: T-tests were conducted to determine differences between initial and final data for questionnaire scores. Results concluded significant improvements in nutrition knowledge (p < 0.001) and perceived stress (p < 0.01). Analysis of mean scores for weights and fitness tests indicated improvements in both areas. Average weight loss for participants was 8.5 pounds. Conclusions: The positive outcomes of this study can be used to effectively develop lifestyle interventions for other high risk populations.

5th Gear Kids: A Multi-Level Childhood Obesity Prevention Program for 5th Graders in Colorado
Thrudur Gunnarsdottir, Michelle Cardel, Jimkaye Beck, Kenny Webb Aurora, CO; Megan Mistle-Jackson Greenwood Village, CO; John C. Peters, James Hill Aurora, CO

Background: A number of school-based obesity programs have been implemented around the world but few have linked interventions in schools with interventions in communities or at home. The 5th Gear Kids Program (5GK) is a community-wide rewards-system, an ‘ecosystem’ providing to participants using the Bright Futures Guide to Emotional Wellness. Goal setting was challenging for this group of women. Further research to examine the how to enhance adherence to goals with this group of women is needed.

Barriers to Diagnosing Obesity at a Major Medical Center: Results of a Survey of Internal Medicine Providers
Kathryn E. Cook, Matthew S. Samaha, Kori M. Klauer, Donald D. Hensrud, Maria L. Collazo-Clavell, Robert A. Wermers, Esayas B. Kebede, Paul S. Mueller Rochester, MN

Background: Past research has shown that health care providers under-diagnose obesity. However, evidence also suggests that obese patients are more likely to attempt weight loss efforts when providers identify and share the diagnosis with them. The goal of this study was to determine barriers to diagnosing and treating obesity. Methods: Based on a literature review and the results of a qualitative study at our institution, we developed a 13 item survey (including 10, 5 point Likert scales and 3 free text questions), which in turn was distributed to 698 health care providers (i.e., physicians, nurse practitioners and physician assistants) in the Department of Medicine (DOM) at Mayo Clinic in Rochester, Minnesota. Results: Overall, 471 (67%) providers responded to the survey. Providers “agreed” or “strongly agreed that the following are barriers to diagnosing and treating obesity: perceived patient motivation (86%), patient knowledge/self-awareness (73%), ability to follow up with the patient (69%), lack of a standard management process (68%), lack of time to address obesity during a patient encounter (68%), patient sensitivity to the diagnosis (67%), provider unpreparedness to diagnose and discuss obesity (63%), provider motivation/sensitivity regarding the topic (46%), and insurance/billing issues (37%). Conclusions: In this large single institution survey, internal medicine providers identified multiple barriers to diagnosing and treating obesity. Most of these barriers are related to provider-patient communication and the topic of obesity as well as a lack of standardized care processes in managing obesity. Medical centers should address these barriers in order to optimize the diagnosis and treatment of patients with obesity. These findings should be correlated with patients’ perspectives on the diagnosis and management of obesity.

Evaluation of Comadres de Salud - An Intervention to Address Obesity in Latino Women
Martina R. Gallagher, Tracey Ledoux, McClain Sampson Houston, TX

Background: The purpose of this pilot study was to evaluate participant acceptability of a culturally sensitive, multi-component, community-based intervention aimed addressing obesity in low-income Latino women of child-bearing age. The intervention is innovative in that it incorporates education on healthy sleep as a way of enhancing adherence to lifestyle change recommendations. Methods: 29 Latino women between the ages of 21-35, who were mothers of children enrolled in a public Pre-Kinder in Houston, TX, were recruited and randomized into control and intervention group. At the end of the 12 week intervention, 4 focus groups were conducted. Results: Qualitative analysis of focus group data revealed that participation in the study was facilitated by 1) having intervention sessions early in the morning in the Pre-Kinder, the interactive small group sessions, and 3) the interaction with other women. Some of the difficulties they encountered during the study were: 1) achieving their goal, and 2) following some of the study protocols, such as keeping track of their food intake. The participants suggested that involving other family members and incorporating group exercise would improve the study. Conclusions: Including other family members in future studies will enhance the concept of familism, would increase the culturally sensitivity. Goal setting was challenging for this group of women. Further research to examine the how to enhance adherence to goals with this group of women is needed.

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Nutritional Epidemiology

**T-812-P**

**Trends in Beverage Consumption among U.S. Infants and Toddlers, NHANES 2001 to 2010**

Yu Wang, Maurissa Mesirow, Jean A. Welsh Atlanta, GA

**Background:** Sugar-sweetened beverage consumption has decreased among older children but little is known about beverage trends among US infants and toddlers. **Methods:** One 24-hour dietary recall from children <2 years in the National Health and Nutrition Examination Survey 2001-2010 (five 2-year cycles) was used to assess beverage intake, including: milk (breast milk, formula, plain, flavored and alternative milks); sugar-sweetened beverages (SSBs; regular carbonated sodas, fruit flavored, sport, and energy drinks); low/no-calorie drinks; coffees and teas; juices (fruit and vegetable juices); and water (flavored and plain). **Results:** The contribution of liquid calories, specifically SSBs, to the diets of US infants and toddlers has decreased, while milk and low-calorie drink consumption has increased, from 14.6% to 16.0% (p=0.02) and 2.0% to 2.4% (p=0.049), respectively. Milk increased from 43.2% to 39.2% (p=0.02) and 5.1% to 4.3% (p=0.049), respectively. **Conclusions:** The contribution of liquid calories, specifically SSBs and fruit juices, to the diets of US infants and toddlers has decreased, while milk and low-calorie drink consumption has increased.

**T-813-P**

**Added Sugars Consumed in Beverages Are Associated with Larger Waist Circumference among Adolescent Females in the NGHS Cohort**

Alexandra K. Lee, Ritam Chowdhury, Miriam B. Vos, Jean A. Welsh Atlanta, GA

**Background:** Sugar-sweetened beverage consumption and abdominal adiposity are both independently associated with increased cardiovascular risk. Research suggests that liquid sources of fructose-containing sugars increase visceral adipose tissue due to rapid digestion and subsequent activation of lipoprotein lipase facilitating uptake of circulating triglycerides into abdominal tissue. This analysis investigated the effect of added sugars consumed in beverages on waist circumference among adolescent females. **Methods:** NHBLI's Growth and Health Study was a 10-year cohort study of Caucasian (n=1,166) and African-American girls (n=1,213) aged 9 and 10 years at baseline (ages 13-14 years) that makes things 9 times harder, clinical priorities (“the patients”) other issues tend to be more pressing”), ineffective treatment and referral (“we don’t have one place with all the options to make a referral”), lack of reimbursement (“a barrier is how to get insurance coverage”), psychological barriers (depression, eating as a coping mechanism, etc.), and socioeconomic factors. **Conclusions:** In this qualitative study, internal medicine physicians identified multiple barriers to diagnosing and treating obesity. These barriers should be prioritized and addressed in order to optimize diagnosis and management of patients affected by obesity.

**Friday, November 15, 2013**

**Poster Abstracts – Wednesday, November 13 to Friday, November 15, 2013**

**Poster Display: 10:00 AM – 3:30 PM**

**Location: Exhibit Hall A**

**Beverages: Perceptions and Practices among Hispanic Parents of Young Children**

Ruba Cheaib, Jeff Holzberg, Monica L. Griffin, Trisha Hardy, Jean A. Welsh Atlanta, GA

**Background:** Concerns have been raised about the impact of children’s sugar-sweetened beverage (SSB) consumption on obesity and chronic disease risk. While the nutrient content is similar, current guidelines identify 100% fruit juice (juice) as a healthy alternative to SSBs but suggest that consumption be limited. The purpose of this study was to assess juice consumption perceptions and practices among Hispanic parents with young children. **Methods:** Between May and June 2013, surveys were administered to 113 parents of children aged 1 to 5 years at a pediatric clinic waiting room to assess their knowledge and practices regarding their child’s beverage consumption. **Results:** One-quarter of the parents reported that juice was the beverage most commonly consumed by their children at meals; compared to water (43.8%), juice-flavored drinks (15.2%) and milk (10.7%). 13.3% of parents reported juice as the most commonly consumed beverage in-between meals compared to water (18.9%), fruit-flavored drinks (9.0%), and milk (42.3%). When asked about their choice of healthy alternative to SSBs, 16.1% of parents identified juice as the top choice and 63.8% identified juice as one of their top 3 choices. Less than half were aware of any existing recommendations pertaining to children’s juice consumption; only 34.5% responded that consumption should be limited. **Conclusions:** 100% fruit juice is commonly consumed among young Hispanic children during and between meals yet few parents are aware of recommendations to limit this consumption. Further study is needed to determine if perceptions and practices related to juice consumption are similar across race/ethnic and other demographic subgroups.

**Change in Beverage Consumption Patterns among Overweight Adolescents Participating in Camp Strong4Life**

Farrah Keong, Laura Colbert, Aimee Adams, Stephanie Walsh, Jean A. Welsh Atlanta, GA

**Background:** Beverage consumption patterns are associated with obesity risk. Camp Strong4Life is a summer camp program designed to promote healthy dietary habits through education and positive role modeling in a fun and supportive environment. The purpose of this study was to determine if participation in Camp Strong4Life is associated with changes in beverage consumption patterns among overweight youth and their parents. **Methods:** In 2012, 48 overweight youth (BMI >85th percentile) age 9 to 15 years (campers) and 34 parents participated in Camp S4L including: Family Welcome Weekend (spring), Camper Week (summer; youth only), and Family Reunion Weekend (fall). Campers and their parents were informed about the health risks associated with sugar-sweetened beverage (SSBs) intake and the benefits of water and low-fat milk. A validated 15-item beverage questionnaire (BevQ) was completed by participants at the Welcome and Reunion weekends. Mean change in consumption was calculated for each beverage and for all SSBs combined. Statistical significance was assessed using paired t-tests. **Results:** Sugar-sweetened soda consumption among youth (mean age 12.3 y; BMI percentile 98.7%) decreased 5.6 ounces/day (p<0.01) between baseline and the follow-up weekends (range 13 to 28 weeks). Reduction in all SSBs (-1.1 ounce/day) and increase in diet beverages (+2.6 ounces/day) approached significance (p=0.06 and 0.08, respectively) but there was no change in other beverages (p>0.10). Campers’ mean body fat decreased 2.9% (p=0.001), Parent beverage consumption patterns did not change. **Conclusions:** Youth but not parent participants in the Camp Strong4Life pro-
gram reduced their usual sugar-sweetened beverage consumption. Further study is needed to assess the long-term impact of the program.

T-816-P
Participation in a Healthy Lifestyle Camp Program Is Associated with Positive Changes in the Food Options Available in the Homes of Overweight Children
Yama Afshar, Jean A. Welsh, Stephanie Walsh, Aimée Adams, Laura Colbert
Atlanta, GA

Background: The home environment is associated with child obesity risk. The purpose of this study was to assess the effect of a healthy lifestyle camp program for overweight children and their parents on the in-home availability of foods and beverages believed to modify this risk. Methods: The Strong4Life Camp program was developed using Social Cognitive Theory to promote healthy lifestyle change among overweight youth (9 to 15 years) and their families in a fun and supportive environment. In 2012, 67 overweight youth and 65 parents/guardian participated in the Strong4Life program including: Family Welcome Weekend (spring), Camp Week (summer, youth only), and Family Reunion Weekend (fall). Thirty-one parents/guardians completed a validated Home Environment Survey (HES) during the Welcome and Reunion Weekends providing a measure of usual availability of fruits, vegetables, sugar-sweetened beverages, and sweets/desserts. We assigned a score of 1 to 5 to each of the Likert scale responses ranging from “Never” to “Always” and calculated a composite mean score (CS) to quantify the availability of foods and beverages within each category. Paired t-tests were used to assess the statistical significance (p<0.05) of the change in CS. Results: The average (standard deviation) CS for the availability of fruits and vegetables increased 0.3 (0.5) and 0.3 (0.4), respectively (p=<0.002 for both) and decreased 0.4 (0.6) for sweets/desserts (p=<0.001) over the study period (mean 4.7 months). Availability of sugar-sweetened beverages was unchanged. Conclusions: Participation in Camp Strong4Life was associated with improvements in the food environment in the homes of overweight children. Further research is needed to assess the sustainability of these changes.

T-817-P
Glycemic Index, Glycemic Load and Their Relations with Adiposity Over a 6-Year Period in the Quebec Family Study (QFS)
Kathryn Adel, Vicky Drapeau, Angelo Tremblay Quebec, Canada; Claude Bouchard Baton Rouge, LA; Louis Pérusse Quebec, Canada

Background: Associations between glycemic index (GI), glycemic load (GL) and adiposity could be confounded by misreporting of dietary intake. We examined associations between GI, GL and adiposity while accounting for energy under-reporting (UR). Methods: GI and GL were determined using 3-day dietary records and GI value tables in 794 non-diabetic participants including 272 with data obtained on two occasions over a 6 year follow-up period. Body mass index (BMI), fat mass (FM), waist circumference (WC) and visceral fat (VF) were evaluated at both times. Associations between GI, GL and obesity were tested using chi-square tests and Pearson correlations. ANOVA was used to compare changes in adiposity over time among tertiles of GI and GL. Goldberg cut-off (1991) was used to determine under-reporters and plausible reporters among participants. Results: Differences in GI and GL (p < 0.005) were observed between obese and non-obese women, with higher GI and GL being associated with higher values of adiposity (0.10 < r < 0.20; p < 0.01), and these associations remained significant after exclusion of under-reporters (23.5 % of women). Moreover, an increase in GL over a 6-year follow-up period was significantly associated with gains in BMI (p=0.005), FM (p=0.03), and WC (p=0.006) in women after adjustment for covariates. However, when accounting for UR, these associations remained significant for under-reporters (n=42) but not for plausible reporters. Conclusions: Our results suggest that GI and GL are associated with obesity in women, and that an increase in the GL of their diet is associated with gains in adiposity over a 6-year follow-up period, which could be explained, in part, by UR.
Early introduction to solid foods (<4 mos; parental report) and child anthropometry (measured) were collected. The proportion of children with BMI-for-age ≥85th percentile was calculated using WHO growth standards. A longitudinal approach was applied (GEE) to a multivariable logistic model to examine weighted relations (accounting for sampling design and non-response) between early introduction to solid foods and odds of being ≥85th percentile, adjusting for race/ethnicity, maternal education, child’s birth weight.

**Results:** At baseline (9m), 35% of children had BMI ≥85th percentile, increasing to 50% by 2 yrs, and returning to 36% by years 4 and 5. Children exposed to solid foods before 4 mos (23%) experienced 33% greater odds of being ≥85th percentile at 2 yrs compared to those given solid foods ≥6 mos (OR=1.33, 95%CI=1.02-1.75). By 5 yrs, children given solid food before 4 mos showed 62% greater odds of being ≥85th percentile than those given solid foods ≥6 mos (OR=1.62, 95%CI=1.24-2.12). Children given solid foods between 4-5.9 mos showed 29% higher odds of being ≥85th percentile at 2 yrs compared to those given solid foods ≥6 mos (OR=1.29, 95%CI=1.03-1.61), but no significant difference between the two groups existed at yrs 4 and 5.

**Conclusions:** The risk for obesity/obesity begins early in life, and may be even greater among children exposed to solid foods before 4 months of life.

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### T-821-P

**Heavier Adults Who Drink Diet Beverages Consume More Food Than Less Sugary Beverage Drinkers**

Sara N. Bleich, Julia A. Wolson, Baltimore, MD; Seanna Vine, Y. Claire Wang; New York, NY

**Background:** Little is known about consumption of diet beverages (artificially sweetened no calorie drinks) among American adults overall and by body weight status. **Methods:** Analysis of 24-hour dietary recall data obtained from the National Health and Nutrition Examination Survey 1999-2010 (N=23,965). **Results:** Overall, 11% of healthy weight, 19% of overweight, and 22% of obese adults drink diet beverages (p < 0.005). Total caloric intake was higher among adults consuming sugar-sweetened beverages (SSBs) as compared to diet drinks (2351 kcal/day vs. 2203 kcal/day, p < 0.005). However, the difference was only significant for healthy weight adults (2302 kcal/day vs. 2095 kcal/day, p < 0.001); the patterns were similar among overweight (2266 kcal/day vs. 2196 kcal/day, p = 0.15) and obese adults (2305 kcal/day vs. 2280 kcal/day, p = 0.57). Among overweight and obese adults, solid food consumption was higher among diet as compared to SSB drinkers (overweight: 1965 kcal/day vs. 1874 kcal/day, p = 0.03; obese: 2058 kcal/day vs. 1897 kcal/day, p < 0.001). The net increase in solid food consumption was substantially and differentially biased for more and less calories in overweight and obese adults who drink SSBs, and consume a comparable amount of total calories as over-weight and obese adults who drink SSBs. Heavier American adults who drink diet soda will need to reduce their consumption of solid food calories in order to lose weight.

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### T-822-P

**Neighborhood Availability of Convenience Stores and Diet Quality: Findings 13 Years Apart in the Longitudinal CARDIA Study**

Pasquale Rummo, Katie Meyer Chapel Hill, NC; Janne Boone-Heimono Portland, OR; David R. Jacobs Minneapolis, MN; Catarina Kielke Worcester, MA; Cora E. Lewis Birmingham, AL; Lyn M. Steffen Minneapolis, MN; Penny Gordon-Larsen Chapel Hill, NC

**Background:** High prevalences of neighborhood convenience stores may lead to less healthy diets. **Methods:** In a biracial cohort of young adults, we quantified the associations between convenience store density and diet quality, adjusted by relevant covariates and evaluated according to race/ethnicity. **Results:** In 2005-06, n=3,089) between convenience store percent and diet variables, adjusting for participant race, age, gender, study center and education; and neighborhood SES, population density, cost-of-living, and total food outlets. We tested for interaction by age, race, and gender. **Results:** In 1992-93, the a priori diet quality score (mean±SD: 66.8±1.2) was differentially associated with convenience store percent by race (p, interaction<0.01). In whites, a ten percentage point increase in convenience store density was associated with a 0.8 lower diet quality score (95% CI: -1.3, -0.3). In blacks, there was no association (0.2; -0.6, 0.6). Convenience store percent was not associated with snack or SSB intake in 1992-93, or with any diet measure in 2005-06.

**Conclusions:** Our findings suggest that more convenience stores, relative to other food establishments, is associated with lower overall diet quality among white young adults, but not with consumption of hypothesized dietary components. The relationship is not evident in blacks and may become less salient in later years.

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### T-823-P

**Evaluation of Existing Equations for the Estimation of Body Fat from Anthropometric Measures in Adults: NHANES 1999-2004**

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**Background:** Equations that estimate percentage body fat (PBF) from anthropometrics are widely used although most were developed in small non-representative samples. No study has examined the generalizability of these equations in a nationally representative population. The goal of this study was to evaluate the validity of 27 sets of published equations for PBF estimation in American adults aged ≥20 years using data from the NHANES 1999-2004 (n=9,934). **Methods:** Equations were evaluated against dual-energy X-ray absorptiometry (DXA) using root mean square error (RMSE) and mean signed difference (MSD). We also compared the MSD by obesity status. **Results:** Most equations included demographic variables and more than one anthropometric assessment using only linear functional forms. In sub-samples matched to the range of age, gender and race/ethnicity in which equations were derived most equations had R2 values between 0.7 and 0.8, but the RMSE estimates were between 3.5 and 4.5 percentage points. Analysis in subsamples stratified by gender, age, obesity status or race/ethnicity showed that discrepancies in MSD of more than 2 percentage points in obese compared to normal weight adults indicated important differential bias in 20 of the 27 equations (p < 0.05 for all). Equations that included WC performed the best in males, and those that included BMI performed best in females. Equations using skinfold thickness performed well less in older or obese adults. **Conclusions:** Published PBF equations had moderately strong R2 values in a representative sample of American men and women, but both non-differential and differential bias were substantial for most future work is needed to examine whether incorporation of population-specific anthropometrics, nonlinear terms and interaction terms could improve the performance of PBF prediction equations.

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### T-824-P

**Glycemic Load - A Predictor of Insulin-Related Outcomes in African- and Hispanic-American Children**

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**Background:** The glycemic index (GI) and glycemic load (GL) of foods are designed to serve as proxies for glycerol response to carbohydrate intake and have been associated with insulin-related measures. Given the interest in maintaining healthy levels of insulin as a preventative strategy for diabetes and the recent climb in pediatric diabetes prevalence, this study tested whether GI and GL were associated with insulin-related outcomes in children and if this was different by race/ethnicity. **Methods:** In a cohort of 322 multiracial children ages 6 – 12, we employed multiple regression analyses to test for associations between GI, GL and insulin-related outcomes. Models were adjusted by relevant covariates and evaluated according to race/ethnicity (European Americans: EA; African Americans: AA; and Hispanic Americans: HA). **Results:** In the overall sample, there were no significant associations between GI, GL and insulin-related outcomes. However, a significant negative association was found between GI and acute insulin response to glucose (AIRg) (p=0.0187) in EA children. In AA, GL was positively associated with fasting insulin (p=0.0034) and negatively associated with insulin sensitivity (p=0.0281). GL was also positively associated with glucose tolerance (p=0.0272) and AIRg (p=0.0380) in HA children. **Conclusions:** In conclusion, the associations between GI and GL and insulin-related outcomes differed between EA, AA and HA children. GL appeared to be a better predictor for insulin-related outcomes.
of insulin-related measures in AA and HA children, but the measures showing significance varied between these two races/ethnicities. Our results reflect differences in glycemic response between children of different racial/ethnic groups and suggest that low GI and GL diets may not result in desired effects across races/ethnicities - an important consideration in nutrition education settings.

T-825-P
Development and Validity of a 3-Day Smartphone-Assisted 24-Hour Recall to Assess Beverage Consumption in a Chinese Population
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Background: In China, diet data shows that sugar sweetened beverage (SSB) consumption remains low despite increases in SSB sales, suggesting that the predominant diet assessment method, a 3-day written-record assisted 24-h recall (WA-24R), inadequately captures beverage intake. Our aim was to develop and validate a 3-day smartphone-assisted 24-h dietary recall method (SA-24R) to enhance recall of beverage intake in a Chinese population.
Methods: Participants were 112 healthy adults ages 25-35 from urban and rural areas around Shanghai, China. Using a randomized crossover design, participants completed a 3-day SA-24R using a video diet record and ecologic momentary assessment to enhance recall and a 3-day WA-24R, using written notes to assist recall. Descriptive statistics (mean ± SD) included average daily consumption (grams and kcal) of total beverages and beverage categories, including SSBs. Pearson correlation coefficients are used to compare mean intake energy and grams consumed of total beverages and SSBs between the 3-day SA-24R and the 3-day WA-24R. To assess validity, in a subset (n=47) total volume (mL) of beverage intake in each method was compared to the total urine volume measured in 24-h urine samples. Results: Preliminary results from rural participants (n=34) show that total beverage intake was significantly correlated between the 3-day SA24-R and the 3-day WA-24R with a correlation coefficient of 0.56 (p=0.01). Over half (57%) of participants reported drinking a SSB during the study. There was no significant difference in energy reported from SSBs during the 3-day SA-24R (49 kcal ± 15) compared to the 3-day WA-24R (51.4 kcal ± 16) (p=0.56).
Conclusions: Amongst rural Chinese adults, use of a 3-day SA-24R provides a valid estimate of total beverage and SSB consumption compared to a 3-day WA24R.

T-826-PDT
Addressing Missing Dietary Recall Data for Young Children in Childcare
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Background: Parent reported 24-hour diet recalls are an accepted method of estimating total energy intake in young children. An often overlooked issue, however, is that many preschool-age children eat meals/snacks at childcare making it difficult for parents to accurately report what or how much their child consumed. Methods: The goal of this study was to develop models to predict full-day intake by imputing missing lunch and daytime snack data for childcare children using data from My Parenting SOS project (n=308 2-5 year old children, 870 24-hr diet recalls). Among childcare children’s recalls, only 5 provided weekday lunch (used to assess construct validity) and only 24% included daytime snacks. Mixed models were used to simultaneously predict breakfast plus dinner (B+D), lunch and daytime snacks for all children after adjusting for age, gender and BMI. From these models we imputed the missing weekday childcare lunches by interpolation using the midpoint between the mean lunch intake to B+D ratio among non-childcare children on weekdays and the lunch intake to B+D ratio for all children on weekends. All available daytime snack data were used to impute snacks. Results: The reported mean (standard deviation) weekday intake was 725 (324) kcals for childcare children compared to 1048 (463) kcals for non-childcare children, while weekend intake for all children was 1173 (427) kcals. After imputation, weekday caloric intake for childcare children was 1218 (418) kcals. The construct validity found protein and fat intake from weekday childcare lunches (n=5) were within the 95% confidence interval (CI) of the imputed childcare lunch intakes; while, total energy, sugar, fiber and carbohydrates were outside the 95% CI for one recall. Conclusions: This work indicates that imputation is a promising method for improving the precision of nutrient data from young children.

T-827-P
Dietary Fiber Linked to Decreased Inflammation in Overweight Minority Youth
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Background: Few studies have examined the relationship between diet and inflammation in children. This study examines the relationship between dietary intake and inflammatory markers in overweight minority youth.
Methods: A cross-sectional analysis of 159 overweight Q85% BMI percentile) Hispanic and African American youth (14-18 years) with the following measures: height, weight, BMI, dietary intake via multiple 24-hour dietary recalls, and inflammation markers (Interleukin-1, IL-6, IL-8, leptin, adiponectin, HGF, NGF, plasminogen activator inhibitor-1 [PAI-1], resistin, and TNF-α) from fasting blood draws utilizing a multiplex panel. Partial correlations and ANCOVAs were run to examine the relationship between dietary variables and inflammation parameters, with the following a priori covariates: Tanner stage, ethnicity, sex, total body fat, and total energy intake.
Results: Partial correlations found total dietary fiber to be inversely related to PAI-1 and resistin (R=−0.22, p=0.01), R=−0.26, p<0.01). ANCOVAs showed that the highest tertile of dietary fiber (>21 g/d) versus the lowest tertile of total intake of total beverages (7.5 mg/mL) of water with 33% lower insulin (102.2 mg/dL vs. 152.6 mg/dL, p=0.04) and 34% lower resistin (29.5 ng/mL vs. 44.6 ng/mL, p<0.02). Similar results were seen for insoluble fiber. Of note, no other dietary variables were linked to any other inflammation markers.
Conclusions: These results suggest that increases in dietary fiber of 14 g/d, which is closer to the U.S. dietary fiber recommendation of 26-38 g/d for adolescents, could play an important role in lowering inflammation and therefore metabolic disease risk in high-risk minority youth.

T-828-P
Use of a Novel Food Diversity Index to Assess the Role of Dietary Variety in Body Adiposity: Findings from the National Health and Nutrition Examination Survey (2003-2006)
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Background: Dietary variety in an obese genomic environment may promote food consumption and contribute to excess adiposity. To clarify these associations, we developed the novel U.S. Healthy Food Diversity(HFD) Index to measure dietary variety alongside dietary quality and proportionality. The objective of this study was to examine the associations between the U.S. HFD with measures of body adiposity in a nationally-representative sample.
Methods: Data from non-pregnant, non-lactating adults ages 20+y with 2 complete 24-hour recalls from the cross-sectional National Health and Nutrition Examination Survey(NHANES) 2003-2006 were used(n=7,460). The odds of excess adiposity as measured by BMI, waist to height ratio(WHR), android:gyroid(A:G) ratio, fat mass index(FMI) and percent body fat were assessed across U.S. HFD quintiles. Multivariate logistic regression adjusted for demographic factors, smoking, energy intake, screen time, and leisure activity were used to compute odds ratios(OR) and 95% confidence intervals(CI)(SAS v9.3).
Results: Higher U.S. HFD scores, reflective of more healthful varied diets, were inversely associated with all measures of adiposity among women in age-adjusted analyses(p<0.05). After multivariate adjustment, the odds of overweight, WHR≥0.5, and AG ratio≥1 were 23-49% lower(p-trend<0.01) in Q5 vs.1 of the U.S. HFD. Among men, the odds of obesity and high FMI in Q5 vs.1 were 43-45% lower(p-trend<0.01) in fully adjusted models. Non-significant protective trends were observed for other measures of adiposity in both sexes. Conclusions: Higher U.S. HFD scores were inversely associated with body adiposity measures in both sexes, indicating that greater variety within healthful foods may protect against excess adiposity. This study explicitly recognizes the potential benefits of dietary variety in obesity and chronic disease management.
T-829-P
Association of Gestational Diabetes (GDM) and Breastfeeding (BF) Practices on Obesity Prevalence in Low-Income Youth
Grace E. Shearrer Austin, TX; Shannon E. Whaley Irwindale, CA; Samantha J. Miller, Benjamin T. House, Jamie N. Davis Austin, TX

Background: Few studies have assessed the effects of GDM and BF on obesity prevalence in offspring, particularly in minority youth. Current studies show either a protective or non-protective effect on offspring. The goal of this study was to examine if BF duration by GDM status impacted the prevalence of obesity in offspring. Methods: GDM and infant feeding data were obtained from a 2011 phone survey with caregivers of low-income children (2-4 y) participating in the Women, Infants and Children (WIC) program in Los Angeles County. The final sample included 2295 children, 84% Hispanic and 48% female. Chi-square and binary logistic regression were used to assess GDM status and BF duration on the prevalence of obesity, with the following a priori covariates: child’s ethnicity, birth weight, age in months, and sex. BF and GDM were significantly associated with obesity prevalence (P=0.01). Results: Using GDM and no BF as the referent category, non-GDM offspring who were BF 1 day to <6 months, 6-12 months, and a 12 months had a 66%, 71%, and 79% decrease in obesity prevalence (Adjusted Odds Ratio (AOR)=0.34, CI 0.92-0.4, P=0.04; AOR=0.29, CI 0.2-0.79, P=0.02; AOR=0.21, CI 0.21-0.57, P=0.01). Only GDM offspring who were BF 12 months had a 72% decrease in obesity prevalence (AOR=0.28, CI 0.89-0.03, P=0.05), whereas the other BF duration groups in this GDM offspring was not significant. Conclusions: These findings suggest that >12 months of BF duration in the GDM group and any duration of BF in the non-GDM mothers is needed to reduce obesity levels in a primarily Hispanic population.

T-830-P
Changes in Waist Circumference Relative to BMI in Chinese Adults from 1993 to 2009
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Background: Body mass index (BMI) and waist circumference (WC) have increased in China in recent decades. This study examined how WC relative to BMI has changed over the past two decades with rapid increase in obesity in adults from 1993 to 2009. Methods: Data on adults aged 20-59 years from 3 waves (1991, 1993 and 2009) of the China Health and Nutrition Survey (CHNS) (1991 n=6,839, 1993 n=6,165, 2009 n=6,656) were used. Stratifying by gender, BMI was regressed on age using quantile regression to examine directional changes in BMI (1991 vs. 2009). Then, in sex-stratified models, WC was regressed on BMI including terms for survey year and the interaction of BMI and survey year, controlling for age, using linear regression (1993 vs. 2009). Results: Increases in BMI across the full BMI distribution were observed over time. For example, based on our model predictions, at the 85th percentile of the sample BMI distribution, 40-year-old males had a BMI of 27.2 in 2009 compared to a BMI of 24.3 in 1991, while females had a BMI of 26.6 in 2009 compared to a BMI of 25.2 in 1991. Further, we found increases in WC at a given BMI value over time. For example, model predictions indicate that for a BMI of 28, 40-year-old males had a WC of 94.7 cm in 2009 compared to 90.5 cm in 1993. For the same BMI and age, females had a WC of 89.6 cm in 2009 compared to 87.1 cm in 1993. Conclusions: Average WC for BMI has changed in China over the past two decades. Not only has the BMI distribution shifted rightward, but at each BMI unit, WC has increased significantly. Chinese adults may be at increased cardiometabolic risk from increased WC, even at equivalent BMI.

T-831-P
Trends in Consumption of Ultra-Processed Foods and Obesity in Sweden Since 1960
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Background: Processed foods and drinks, i.e. convenience or junk food with low nutritional content from industrial manufacturing, may play a major role in the obesity epidemic. We aimed to investigate how the consumption of ultra-processed foods has changed in Sweden in relation to the increased prevalence of overweight and obesity. Methods: National trends in per capita food consumption from 1960 to 2010 were investigated using data from the Swedish Board of Agriculture. Food items were classified as group 1 (unprocessed or minimally processed), group 2 (cereal/food industry ingredi-
DV and DRE and EI, BM and reported EI, or BM and DV or BMI change. Conclusions: Our data reinforces associations between BM and EI, as well as EI and DRE, indicating that DRE is due more to EI than BM. We observed an association between DV and reported EI, but not between DV and true EI. We also found a new association between DV and lower DRE. Future studies are needed; longer studies may show larger changes in BM that have significant associations not found here. It is also important to determine if the way DV is defined will affect its relationship with true EI.

T-834-P Behavioral Correlates of Adult Daily Consumers of Sugar-Sweetened Beverages, 2011 Behavioral Risk Factor Surveillance System
Sohyun Park, Leping Pan, Bettylou Sherry, Heidi Blanc
Atlanta, GA
Background: Excess intake of sugar-sweetened beverages (SSB) is linked to weight gain. Although recently SSB intake has been increasing, it still remains high among some U.S. adults. There is limited information on behavioral factors associated with SSB intake among U.S. adults. Methods: The 2011 Behavioral Risk Factor Surveillance System data for 38,978 adults (≥18 years) from 6 states were used. The outcome variable was SSB intake (2 questions: regular soda and fruit drinks). Multivariate logistic regression was used to estimate adjusted odds ratios (OR) and 95% confidence intervals for characteristics associated with SSB intake. Results: Overall, 23.8% of adults reported drinking SSB ≥1 time/day with 10.7% doing so ≥2 times/day. Adjusted odds ratios of drinking SSB ≥1 time/day were significantly greater among younger adults, males, non-Hispanic blacks, adults with lower education levels, those with lower household income or with missing income data, adults with whole fruit intake of <1 time/day (vs. ≥1 time/day), those who were physically inactive (vs. highly active), current smokers (vs. nonsmokers), and adults who lived in Delaware, Iowa, and Wisconsin (vs. Minnesota). The factor most strongly associated with daily SSB intake was age; the OR compared to adults aged ≥70 years decreased as age increased (OR ranged from 3.37 for 18- to 29-year-olds to 1.37 for 50- to 59-year-olds). However, odds for drinking SSB ≥1 time/day were significantly lower among adults with 100% fruit juice of <1 time/day (OR=0.73; vs. ≥1 time/day) and adults who consumed alcohol (OR=0.81 for any drinking and OR=0.66 for heavy drinking; vs. no drinking). Conclusions: These findings can help public health professionals and health care providers identify adults most in need of counseling and prevention efforts to decrease SSB intake and increase healthier beverage intake.

T-835-POT What Factors Promote a Healthy Home Food Environment?
Amy Roberts, Jianwen Cai, June Stevens
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Background: The foods available in the home are associated with child diet and obesity. To understand the full impact of this food environment it is critical to determine the factors that influence the foods available in the home. Methods: Using objectively collected exhaustive home food inventories from 80 African American first time mothers, we determined associations of 8 predictors including shopping habits, eating out, food security and weight status of household members on the foods in home. We used generalized estimating equations controlling for household size and composition and other covariates. Results: Households with recent (<7 days) large shopping trips, or frequent trips (bi-weekly) had more calories and grams of fat available in the home, and energy density did not differ. Eating out for breakfast, lunch or dinner had little impact on the food composition in the home. However, households eating out for snacks 3-8 times/month had significantly more calories, and fat, percent energy from fat and percent energy from non-oil fat than those who ate out more or less frequently for snacks. Food insecure homes had 49,348 fewer kCal than food secure homes (p=0.03). They also had significantly less total fiber, total fat, and total non-oil fat than food secure homes, while energy density and number of food items did not differ. Additionally, we observed that households with obese mothers had 65,958 more kCal than households with normal weight mothers (p=0.01). Similar trends were seen for total fat. Households with overweight children had significantly more kcals, fiber, and fat than households with normal weight children. Conclusions: This study addresses an important gap in our understanding of the factors that influence foods available in the home and will inform in-home obesity prevention strategies and interventions.
Healthy Obesity Is Not Associated with Food Intake in White and Black Women

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Background: Metabolically healthy obesity may confer lower risk for adverse health outcomes compared to abnormal obesity. Diet is postulated to influence the phenotype but its role is insufficiently understood. Race may in turn modify the relationship between diet and healthy obesity but the inter-relationships of diet and race on the phenotype are unclear. Methods: We tested the hypothesis that healthy obesity is associated with higher consumption of healthy foods (such as vegetables, fish) and lower intakes of less healthy foods (such as processed meat, sugar-sweetened beverages) than abnormal obesity but similar food intakes as healthy normal weight in a cross-sectional study of 25(OH)D levels and BMI z-score. Food intake was assessed, respectively. Women were more likely to be overweight twelve months postpartum among women of low socioeconomic status.

Conclusions: Our findings do not support the hypothesis that healthy obesity is associated with a healthy diet. Additional research using prospective models and dietary patterns, a better indicator of usual diet, is needed.
Background: Parental awareness of dietary recommendations is known to influence the diet of the children which in turn has a large effect on their risk for obesity in childhood. While the prevalence of obesity is higher among Hispanic children than white or black children, the extent to which their parents are knowledgeable about and seek to comply with current dietary recommendations is unknown. Methods: In spring 2013, 107 Hispanic parents/primary caregivers of children aged 6 months to 6 years attended a pediatric clinic and completed a waiting room survey designed to assess the feeding practices of their child. The survey also estimates the parent’s knowledge about U.S Dietary Guidelines related to the intake of fruits and vegetables, whole grains, sugar-sweetened beverages and milk. The proportion of parents who respond correctly to each item was calculated. Results: The majority of parents/caregivers (89.7%) were women, 90.5% of low family income, and 47.2% had received prior nutrition training. Among them: 41.3% knew that it is recommended that half of children’s meals should be fruits and vegetables; 36.4% thought that fruit-flavored drinks, Gatorade or soda was a healthy alternative to beverages high in sugar. The majority of parents (83.2%) knew that children often need to try a new food multiple times before learning to like it but over half (52.3%) believed that it was OK to make their child something else if they rejected the meal that had been served. Conclusions: Many Hispanic parents of young children lack knowledge of and/or failed to comply with current child nutrition and feeding practice recommendations. Studies to determine if programs designed to improve child nutrition knowledge among these parents are effective in modifying behaviors.

Conclusions: Coffee intake is inversely associated with incident central obesity in Chinese. Coffee may be a protective agent for central obesity in Chinese.
Implemented through mobile technology to produce promising and significant intervention for difficult to reach, underserved, high risk populations can be achieved. An average weight loss of 8.3% was achieved with an average BMI reduction of 3.2 units. Results: A total of 134 drivers, with an average BMI of 40.2, started the program. 73% of drivers were able to lose 5% or more of their beginning body weight and 36% were able to lose 10% or more. An average weight loss of 8.3% was achieved with an average BMI reduction of 3.2 units. Conclusions: The Lindora Showdown program showed that a weight loss intervention for difficult to reach, underserved, high risk populations can be implemented through mobile technology to produce promising and significant results.

**T-848-P**

**Non-Supplemental Nutrient Intake During Pregnancy and 3 Months Postpartum**

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**Background:** Among pregnant or postpartum women, relatively few data have been published on macro- and micronutrient adequacy excluding the use of diet supplements. **Methods:** Using data collected from 24 hour dietary recalls, we evaluated the nutrient intake during pregnancy and follow-up (3-months postpartum) in 110 women without gestational diabetes. We then compared the intake levels to the dietary guidelines from both the American College of Obstetricians and Gynecologists 2012 and the USDA’s 2010 Dietary Guidelines for adult women less than 50 years. **Results:** The mean age was 29 (19-43) years, 62% White, and the majority of participants reported education beyond high school. The pre-pregnancy BMI was 27.2±6.1 kg/m2 and 52% were overweight or obese. At baseline, the total carbohydrate, protein and fat were all within recommended ranges. **Conclusions:** These observations indicate that while macronutrients are being met, diet quality is at risk, with vital micronutrients crucial to fetal development and health of the mother below recommended levels. Efforts to educate and encourage women to consume a balanced and nutritious diet should be emphasized during all life stages.

**T-849-P**

**Food Marketing at Children: Does It Hold the Balance of Power?**

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**Background:** Childhood obesity is a well-established phenomenon affecting both developed and developing countries. The study was aimed, in a controlled condition, at evaluating the effect on the amount of snacks eaten of (i) having food presented with toys in the package, (ii) being exposed to TV when snacking, (iii) without or with advertising (at an increasing intensity during TV exposure). **Methods:** 80 children (balanced according to gender and age groups, 3-6 and 7-10 years old) were randomised in two schools of Santiago de Chile (Chile) to be exposed in an experimental setting to snacks, alone or associated with toys. Children were asked to eat ad libitum for 20 minutes during the afternoon break. In the TV group, children were in addition randomized to be exposed to three increasing levels of exposure to commercial advertising (1, 2 or 3 times during the TV session). Anthropometrics and socio-demographic data were recorded. Brand awareness was evaluated prior to the study. **Results:** No significant differences emerged between NoTV and TV groups. Registered energy intake and glycemic load showed respectively a median value of 233.26 kcal and 12.71, corresponding to a median of 2 snacks for each child. No significant association between energy intake and gadget was found (p=0.924). Also when evaluated energy intake after movie and advertising exposure, no significant association was found (p=0.541). **Conclusions:** The hypothesis that toys might have an effect on increasing energy intake in children was not confirmed. The median consumption was not significantly different in the two subgroups, Toy and NoToy. Results did not confirm neither the boosting effect of TV exposure and advertising on energy intake.

**T-850-P**

**Effect of the U.S. School Lunch Program on Metabolic Parameters in Obese Children in Dallas, Texas**

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**Background:** More than one-third of children and adolescents in the U.S. are currently overweight or obese, and the nutritional standards of the National School Lunch Program have come under scrutiny as a possible contributing factor to the child obesity epidemic. The effect on metabolic parameters is largely unknown. **Methods:** We conducted a retrospective review of electronic medical records from patients ages 4-17 referred for obesity to a pediatric multidisciplinary obesity clinic at Children’s Medical Center in Dallas. Multiple regression and ANCOVA analyses were performed to find an association on eating school-provided meals with metabolic parameters that included: fasting glucose, fasting insulin, HOMA-IR, 2 hour glucose after a standardized oral glucose tolerance (OGTT), HgbA1c, triglycerides, LDL, HDL, non-HDL cholesterol, ALT, AST and vitamin D25OH levels. **Results:** Data from 758 patients were analyzed. Mean age was 11.6 ± 3.0, 47% were male, 49% Hispanic, 27% Caucasian and 17% African American. Mean BMI Z-score was 2.3 ± 0.35. 81% had government insurance. 54% were eating school lunch and 33% both school breakfast and lunch. Using a model that adjusted for age, ethnicity, insurance status, BMI Z-score, skipping meals, fasting insulin and eating school lunch only, we found that eating the school-provided breakfast and lunch had a statistically significant independent positive association with the 2 hour blood glucose (p<0.03, model R²=.07, p<.0001), and with the HgbA1c concentration (p=.0013, model R²=.14, p<.0001). No correlations were found for other metabolic parameters. **Conclusions:** In this population, children who consumed school-provided breakfast and lunch had higher 2 hour glucose and HgbA1c levels and might be at higher risk for type 2 diabetes than children who ate one or no school-provided meal.

**T-851-P**

**Normal Weight Obesity and Risk of Disability in the Older Adults: Data from HANES III**

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**Background:** Body mass index (BMI) strata likely misrepresent the accuracy of true adiposity in elders. Elders with normal BMI but elevated body fat are at higher metabolic risk but whether it impacts function is unknown. **Methods:** Subjects aged ≥60 years from National Health and Nutrition Examination Surveys III (1988-1994) were included. Normal weight obesity (NWO) was determined using tertiles of %body fat (BF%). Overweight and obese BMI subjects were also stratified by tertiles. Data on functional impairments (FI), instrumental (IADL) and basic activities of daily living (BADL) were obtained. Multivariate logistic regression modeling (referent–lowest tertile) was used to model disability adjusted for age, sex, and race with and without lean mass (LM) in our models. **Results:** Of 4398 subjects (2259 for author conflict of interest information, see page S264 S247
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(51.8% female), 1528 (34.7%) had a normal BMI. Normal BMI in the highest tertile of body fat [n=505(29.9%)] had similar rates of CHF, MI, Stroke and COPD compared to the lowest or middle tertiles. LM was lower in NWO compared to those in the middle or lowest BF% tertiles (42.6 vs. 44.9 vs. 45.4 kg/m²; p<0.001). NWO subjects had greater functional impairment [OR 1.62 (95% CI:1.11-2.36)] compared with the lowest tertile. For adjusting LM, FI was similar in NWO subjects [OR 1.46 (0.99-2.15)]. Overweight and Obese subjects (respectively) in the highest BF% tertile had higher risk of FI after adjusting for LM [OR 1.73 (1.17-2.56) and 1.97 (1.19-3.26)]. Only obese subjects in the highest BF% tertile were associated with elevated risk of IADL and BADL impairments [OR 1.89 (1.08-3.32) and 2.32 (1.50-3.58)].

Conclusions: Older adults with NWO may not be at increased risk for impairment in disability. Our results suggest that the effect is attenuated after adjusting for LM highlighting the interplay between muscle and adipose tissue on function in older adults.

T-852-P
Adiposity and Risk of Disability in Older Americans: Data from NHANES III
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Background: Current body mass index (BMI) strata likely misrepresent the accuracy of true adiposity in elders. Whether adiposity measured by body fat % (BF%) is associated with functional outcomes requires further study.

Methods: Subjects aged ≥60years with a BMI≥18.5kg/m2 with anthropometric and bioelectrical impedance measures from NHANES III (1988-1994) were included. We created sex-specific tertiles of BF%. Data on functional impairments (FI), instrumental (IADL) and basic activities of daily living (BADL) were obtained. Comparative rates among each tertile group using multivariate logistic regression modeling (referee—lowest tertile) were assessed. Base model adjusted for age, sex, fat-free mass and race, separately adjusting for BMI as a categorical and continuous variable. Results were weighted using NHANES methodologies. Results: The final sample included 4,484 subjects, mean age 69yrs. Lean mass was higher in the elevated BF% group than the other subgroups (52.5 vs 50.7 vs 47.2; p<0.001). Subjects in the highest BF% tertile had higher risk of FI than the referent category, although using BMI as a continuous variable as compared to a categorical variable attenuated the association with BF% [OR 1.65 (1.26-2.13) and OR 2.08 (1.50-2.86), respectively]. Subjects in the highest tertile had higher risk of IADLs and BADLs using BMI as a categorical variable [OR 1.61 (1.22-2.11) and 1.92 (1.36-2.99), respectively]. Using BMI as a continuous variable attenuated the effect on both IADLs and BADLs [OR 1.120.77-1.63] and 1.58 [1.11-2.27]]. Conclusions: Elevated BF% is likely associated with increased risk of impairment in older adults. Our results highlight the importance of recognizing that obesity is associated with disability in older adults, but that incorporating standard BMI categories into our analyses may overestimate needs and re-visiting in older adults.

T-853-P
Intervention Programs to Improve the Quality of the School Lunch Packs: Systematic Review
Ernestina Santillana, Montserrat Bacardi-Gascon, Arturo Jimenez-Cruz Tijuana, Mexico

Background: School lunch packs (LP) have been found to be unhealthy. It is recommended that a healthy LP should include fruits, vegetables and whole grains. Several studies have explored the efficacy of promoting the inclusion of fruits and vegetables in the LP. The purpose of this study was to analyze randomized intervention trials assessing the effect of programs addressed to improve the quality of the LP and the consumption of fruits and vegetables among school age children.

Results: Five studies were reviewed, which included 2.5 to 11 years old children. The time of intervention ranged from 0.5 to 33 months, and the retention rate was 75%. In all the studies it was observed a significant increase in the consumption of fruits and vegetables in the intervention group compared with the control group. Conclusions: This review shows a consistent positive effect of intervention programs addressed to improve the quality of the LP and the consumption of fruits and vegetables among school age children.

T-854-P
Nutrition and Physical Performance in Athletes with Intellectual Disability and the Knowledge Level of Their Caregivers
Blanca E. Hernandez Martinez, Ana O. Caballero Lambert Leon, Mexico; Patricia L. Guevara Sangines Guajajato, Mexico; Judith Orozco Mendez, Ana K. Estrada Salas Leon, Mexico

Background: Population with intellectual disability presents risk factors to health and nutrition; there are only few studies that characterize this problematic situation. Methods: The objective of this study was to determine food intake, nutrition diagnosis, physical performance and hydration status in 179 athletes with intellectual disability belonging to a Mexican Special Olympics organization, as well as knowledge level and hydration habits of parents or caregivers. A descriptive study was conducted. Food intake was obtained through a validated semi-quantitative questionnaire (SNUT); nutrition diagnosis was determined by anthropometry; physical performance was evaluated by DIDEFIT® tests; hydration status was determined by urinary density; and parents or caregiver’s knowledge level and habits of hydration and nutrition were evaluated by two validated questionnaires. Results: Age group 11-20 y presents the highest calorie and macronutrient intake. Nutritional assessment shows that 43.6% of the participants are overweight and 4.5% low weight. Findings in physical tests show a tendency to monotonic growth in the strength of the hand and abdominals per minute, a parabolic tendency in the horizontal jump and a hazardous representation in the flexion of the trunk. 56.42% of the athletes presented dehydration. Analyzing the parents/caregivers questionnaires, we found that the knowledge one had a statistically significant higher grade than the questionnaire regarding hydration habits. Conclusions: Athletes with intellectual disabilities are a risk group because they present factors such as lower weight and overweight and dehydration; their parents or caregivers lack knowledge in nutrition and good hydration habits, factors which could put them in health and physical performance risk.

T-855-P
Breakfast Patterns among Low-Income, Ethnically Diverse Elementary School Children in an Urban Area
Hannah G. Lawman, Stephanie S. Vander Veur, Heather M. Polonsky, Timothy A. Sanders Philadelphia, PA; Lisa Bailey-Davis Danville, PA; Janet Ng Hartford, CT; Gary D. Foster Philadelphia, PA

Background: School breakfast has been advocated to prevent childhood obesity. Students’ breakfast patterns at and outside of school are not known raising the possibility of multiple breakfasts that would have negative consequences for energy intake and obesity. The aim of the current study was to describe morning food and drink consumption patterns among low-income 4th-6th graders in 3 schools in an urban public school district.

Methods: Youth (n=650; 51.7% female; 61.2% African American, 10.7 years old) completed surveys at school (>94% of schools’ students eligible for free/reduced meals) and self-reported all locations and foods eaten that morning. Height and weight were collected by trained research staff.

Results: 16.4% of youth reported eating no breakfast, 48.3% reported one breakfast, 24.4% reported two breakfasts, and 10.9% reported >3 breakfasts. Among those who did not eat breakfast, reasons included not being hungry (36.7%), not having time (47.5%), not having food (1.7%) or money (3.3%), or disliking available foods (10.8%). Overweight/obese youth reported consuming significantly fewer breakfasts compared to healthy weight youth (mean=1.2 vs. 1.4, p<0.05). Gender, grade, ethnicity and previous night dinner consumption were not associated with the number of breakfasts consumed.

Conclusions: Youth are eating breakfast at multiple locations. These findings may have implications for school breakfast policies, childhood obesity, and food insecurity.
Imaging and Biomarkers

**T-857-P**

Increased Central and Peripheral Adiposity in Large for Gestational Age Neonates Exposed to Excessive Gestational Weight Gain

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**Background:** To investigate neonate body composition and fat distribution (central versus peripheral fat mass (FM)) by birth weight category (<10th percentile, small for gestational age (SGA); 10-90th percentile, appropriate for gestational age (AGA) and >90th percentile, large for gestational age (LGA)) and gestational weight gain (GWG; appropriate versus excessive).

**Methods:** Body composition was assessed in 292 neonates using air displacement and skinfolds (SKF) (subscapular, biceps and triceps) at 1-3 days. Peripheral FM was calculated as the sum of biceps and triceps SKF/2 and central FM was represented by the subscapular SKF. ANCOVA was used to investigate the main effects of birth weight and GWG categories and their interaction on infant body composition and FM distribution. **Results:** A significant interaction between birth weight and GWG categories was detected for central and peripheral FM but not infant body composition. Within the LGA group, infants from mothers that gained excessively had greater central FM (appropriate: 4.3 mm; excessive: 5.2 mm, p=0.004) and peripheral FM (appropriate: 4.1 mm; excessive: 5.0, p=0.001) than offspring from mothers that gained appropriately. No differences were found within SGA or AGA for central or peripheral FM. A description of mothers of LGA neonates found the following: 50% were normal weight, 43% were overweight and 7% were obese with the following mean GWG for those classified as excessive: 20.0 kg, 16.5 kg and 20.7 kg, respectively. **Conclusions:** Greater central and peripheral FM is found in LGA infants born to mothers that gain excessively.

**T-859-P**

Noninvasive Biomarkers for Monitoring Cardiometabolic Risk in Children

Jill Cochran, Hillary Anderson, Jennifer A. Hoke, Kenslea Ratliff, Tamara Sharp, Maria Soukup, Michelle Vanoy-Warner, Kristie G. Bridges, Lewisburg, WV

**Background:** Screening for complications of obesity in children is necessary but many parents do not comply with referrals for phenotyping. The purpose of our study was to address this barrier by identifying salivary biomarkers associated with cardiometabolic risk factors in children. **Methods:** Children participating in CARDIAC Boot Camp, a program for patients who are overweight or obese or have other risk factors, were recruited for this study. After obtaining parental consent and assent from the child, blood pressure, height, weight and waist circumference were measured. Saliva samples were collected and tested for uric acid using enzymatic methods. Salivary insulin and adiponectin were measured using a multiplexed bead assay. Information including blood lipid and glucose levels was obtained from the medical record of the visit resulting in referral to Boot Camp. **Results:** 32 patients participated in the study (mean age 9.2 years). 83% were obese, 42% were hypertensive, and 35% had acanthosis nigricans. Only 54% had blood test results available in the medical record illustrating the lack of compliance with fasting blood draw in children. Uric acid, adiponectin and insulin could all be detected in the saliva samples. Salivary uric acid was higher in those with hypertension (systolic or diastolic BP >295th percentile) than those without (p = .043). Salivary insulin was higher in patients with acanthosis (p = .027).

**Conclusions:** Several serum biomarkers associated with cardiometabolic risk can be measured in the saliva of children. Additional studies are needed to investigate their predictive value. The ability to monitor changes in cardiometabolic health without requiring blood sampling could increase risk awareness in parents resulting in greater motivation to make lifestyle changes.
tor Machine (SVM) learning algorithm. SVM maps a set of x input features onto a higher m-dimensional space using fixed nonlinear mapping, and then performs a linear regression between input features in. We used 5 input features to predict BD_dxa including age, height, weight, BD_adip and BV_photo.

Results: Mean BD_dxa and BD_photo were 1.04±0.02 and 0.88±0.02, respectively. The cross validation models after controlling for age, weight, and height, and BV_photo explained an additional 9% of the variance in BD_dxa (total R² =0.86) in this analysis.

Conclusions: Our preliminary findings suggest that a computer image analysis algorithm can be used to accurately predict body fatiness in humans from digital photographs. However, further research is needed to refine this image analysis approach and to extend this method to the broader population.

T-861-P

Accurate and Rapid Identification of Neutralizing Antibodies to Adipogenic Adenovirus Ad36
Olga Dubusson Baton Rouge, LA; Cynthia L. Chappell, R. S. Day Houston, TX; Nikhil V. Dhurandhar Baton Rouge, LA

Background: Infection due to Ad36, a specific serotype of human adenovirus, is linked with increased adiposity, better glycemic control and lower hepatic lipids causatively, in animals, and correlative in humans. Serum neutralization assay (SN), the gold standard that detects neutralizing antibodies (NA), is used to specifically detect Ad36 infection. However, SN needs 14d, and considerable training. We evaluated the accuracy of available Enzyme-immuno assay (ELA) kits to detect NA to Ad36. A modified SN assay that is less subjective and faster is presented.

Methods: Sera of 31 subjects who were seropositive (n=15) or seronegative (n=16), by SN were tested for antibodies as follows: 1) A repeat SN to test reproducibility; 2) A non-Ad36 specific EIA to detect antibodies to all human adenoviruses (NS-ELA) which detects Ad5, Ad7, Ad21, Ad35, Ad37, Ad40, Ad42, and Ad48; 3) A novel combination of SN and immune staining (SN-IS) kit (Cell BioLabs, #VPK-111). Results: Repeat SN showed exact reproducibility. As expected, about 94% samples tested negative by NS-ELA showed antibody presence, probably to other human adenoviruses. All seronegative samples (by SN) were false positive by Ad36-ELA. SN-IS showed 100% specificity with 97% sensitivity of the samples, in identifying Ad36 NA status.

Conclusions: The EIA kits tested are not suitable for detecting NA to Ad36. The use of SN with immune-staining preserves the accuracy of detection, eliminates subjectivity in screening and reduces the assay time to 5 d.

Friday, November 15, 2013

Statistical Methods

T-862-P

Development of a Pregravid Weight Calculator: Insights Into the Validity of Self-Reported Pregravid Weight in Overweight and Obese Pregnant Women
Diana Thomas, Mima W. Halawani Monclair, NJ; Suzanne Phelan San Luis Obispo, CA; Nancy F. Butte Houston, TX; Leanne Redman Baton Rouge, LA

Background: Gaining weight within the Institute of Medicine (IOM) guidelines leads to healthy pregnancy outcomes. To calculate gestational weight gain, clinicians and researchers need an accurate measurement of pregravid weight. Moreover, since the IOM guidelines differentiate weight gain recommendations based on pregravid body mass index (BMI) classifications, precribing the correct amount of weight gain is dependent on accurate knowledge of pregravid weight. Unfortunately, in most cases, pregravid weight is self-reported which can be an unreliable measure. Methods: After testing the validity of self-reported pregravid weight, four models were constructed using two comprehensive clinical databases containing weight directly measured before pregnancy and during the first trimester. Maternal age, race, height, and both gestational age and measured weight at the earliest first trimester visit, were used to predict pregravid weight. Each model was validated on independent data not used for model development. Bland-Altman analysis was performed to test the validity of each model. Results: Self-reported pregravid weight correlated remarkably well with measured weight (R²=0.98); however, the Bland-Altman analysis suggested a mean bias (−0.62 kg), indicating increased underreporting of pregravid weight with higher BMI classifications. The developed models validated well, demonstrating good agreement and low bias: (R²=0.96, Bias =0.06, confidence intervals [-5.46, 5.58]). Conclusions: The developed models provide an alternative method for health care providers and researchers to determine empirical pregravid weight and appropriately classify women into the correct set of BMI-specific IOM gestational weight gain guidelines. The models have been extended to an online tool for use in clinical research and prenatal care.

T-863-P

Identifying Measurement Error in Body Mass Index (BMI) Data for Children: Alternative Approaches to the Biologically Implausible Centers for Disease Control and Prevention (CDC) Growth Chart Flags
Sophia E. Day, Kevin Konty Long Island City, NY; Stuart H. Sweeney Santa Barbara, CA; Cathy A. Nonas, Tiffany G. Harris Long Island City, NY

Background: CDC growth charts are commonly used to define childhood obesity and include an indicator for biologically implausible values (BIV) in BMI data. We evaluated the accuracy of these BIVs and examined alternative methods for defining implausibility. Methods: CDC’s growth charts were used to obtain BMI z-scores (BMiz) and CDC-defined BIVs for all student observations. We used the 2006-10 BMI data as a reference population to create empirically-defined BIV cut-points (μ±σ) by age and sex and used the same criteria for students with 2 consecutive measurements to define cut-points for implausible changes in BMIz (BMIZA). We applied all cut-points to the 2010 school year and compared CDC-defined BIVs with empirically-defined BIVs, implausible BMIzA and longitudinal growth curve models using quantile regression. To account for systematic errors, we identified schools with abnormally large BMIzA using composite percentiles (cp) of BMIzA and flagged schools with >30% of students in the top or bottom 10% of cp. Results: In 2010, 14,176 students were CDC-defined BIVs. 50% (n=7,066) of these students are determined plausible using empirically-defined BIVs and 5,431 additional students were identified BIVs from implausible BMIzA. Using model defined BIVs resulted in less stringent criteria and only removed 0.5% of the records; 3.4% of students were newly identified BIVs at the school-level. Conclusions: CDC-defined BIV rely on the distribution of the tails of the reference data (from 1963-1994) and may not reflect the current obesity epidemic. The empirical cut-points may offer a better method for identifying BIVs since it uses a current population and may have more observations in the tails of the underlying distribution. Further, to improve childhood obesity estimates, longitudinal data can be used to establish BIVs and to identify schools with systematic problems.

T-864-P

The Impact of Implementing Self-Calibrating, Digital Scales That Include Stadio-Meters on Childhood Obesity Estimates in NYC Public Schools, Grades K-8, 2010-2011
Kevin Konty, Sophia E. Day, Tiffany G. Harris Long Island City, NY

Background: Annual height and weight measurements have been collected for all New York City (NYC) public school children since 2005. In 2011, self-calibrating, standardized scales with stadio-meters were installed. This analysis quantifies the impact of the new scales on obesity estimates.

Methods: Age- and sex-specific percentiles, z-scores, and Biologically Implausible Values (BIVs) were calculated using CDC growth charts (obesity defined as BMI≥95th percentile). A repeated cross-sectional trend model was used to quantify the impact of the new scales while controlling for demographic characteristics. Additionally, we identified those students as Biologically Implausible Values (BMIzA) that are the empirical cut-points for implausible BMIzA and flagged schools with abnormally large BMIzA. We evaluated the accuracy of these BIVs using quantile regression. To account for systematic errors, we identified schools with abnormally large BMIzA using composite percentiles (cp) of BMIzA and flagged schools with >30% of students in the top or bottom 10% of cp. Results: In 2010, 14,176 students were CDC-defined BIVs. 50% (n=7,066) of these students are determined plausible using empirically-defined BIVs and 5,431 additional students were identified BIVs from implausible BMIzA. Using model defined BIVs resulted in less stringent criteria and only removed 0.5% of the records; 3.4% of students were newly identified BIVs at the school-level. Conclusions: CDC-defined BIV rely on the distribution of the tails of the reference data (from 1963-1994) and may not reflect the current obesity epidemic. The empirical cut-points may offer a better method for identifying BIVs since it uses a current population and may have more observations in the tails of the underlying distribution. Further, to improve childhood obesity estimates, longitudinal data can be used to establish BIVs and to identify schools with systematic problems.
estimates by decreasing measurement error and indicate that previous estimates may have been low, especially in grades 6-8. The previous underestimation and the new scales accounting for most of the observed increase in obesity suggest that obesity actually decreased from 2010 to 2011.

T-866-P
Modeling Obesity Associated Years of Life Lost: A Significance Test to Compare Predictive Accuracies of Non-Nested Models
Tapan Mehta, David B. Allison Birmingham, AL
Background: Predicting median longevity associated with obesity and estimating the years of life lost (YLL) compared to normal weight is an important public health question for the policy makers. Federally defined broad BMI categories are commonly used in obesity-mortality studies. However, previously it has also been reported that inverted BMI is a more suitable predictor instead of BMI. And yet there are many other forms of continuous BMI (polynomial, fixed knot spline, free knot spline etc.) that may statistically significantly improve predicting YLL associated with obesity. Statistically, this reduces to evaluating the predictive accuracy of non-nested models.
Methods: We used an approach analogous to leave one out cross-validation and estimated errors defined by a quadratic loss function. Using this approach, and subsequent approaches were constrained to three patterns, as such, this reduces to evaluating the predictive accuracy of non-nested models.
Results: We included 11,444 children ages 2-6y from three nationally representative cross-sectional diet surveys. Data from multiple sensors must be integrated during over extended periods. Methods: To support behavioral studies we are building a flexible data management system. It automates acquisition, quality assessment, initial processing, imputation and segmentation, and presentation from multiple disparate sensors in real time. Analysis can be generalized as applying processing to continuous time series (accelerometers and other streams), periodic (inputs triggered by time), and asynchronous data (triggered by device or user status, location patterns). Multi-tasking smartphone can perform preliminary processing sufficient to prompt subjective actions and responses. Results: The system is supporting current trials. One at Brown University is a cross-over study on 40 patients after bariatric surgery. It examines the timing and content of motivational messages delivered to promote PA after durations of inactivity for 3 weeks. Raw acceleration data recorded with a smartphone is processed in 1 min epochs to PA criteria which trigger requests to the participants and display progress indicators. All the data are uploaded every 30 min and integrated to provide the researcher with a view of phone/software status, subject actions, and compliance. The remote system reconfigures the smartphone software at cross-over and applies updates. The process, including data uploads, has been successful for thirteen participants enrolled. Conclusions: Researchers need systems that allow them to integrate disparate sensor, software and algorithms that minimize burden on participants.

T-866-P
Comparing Three Analytical Approaches to the Study of Dietary Patterns Over Time Using Multiple Cross-Sectional Data Sets
Chris N. Ford, Patrick T. Bradshaw, Shu Wen W. Ng Durham, NC
Background: Amid increasing interest in modeling dietary patterns over time, this analysis contrasts three approaches to modeling dietary patterns using multiple nationally representative cross-sectional diet surveys.
Methods: We included 11,444 children ages 2-6y from three nationally representative US dietary surveys: the Nationwide Food Consumption Survey 1977-1978; the 1994-1998 Continuing Survey of Food Intakes by Individuals; and the National Health and Nutrition Examination Survey, years 2007-08 and 2009-10. Diet data were grouped into categories and normalized percent of daily calories from each were calculated. Principal components analysis was used to determine independent dietary patterns and, in one approach, these factors were subsequently grouped by k-means cluster analyses to create disjoint categories of dietary behavior. Three patterns emerged from this approach, and subsequent approaches were constrained to three patterns for continuity. The factors were also used independently in the second approach, and cluster analyses was performed directly on the normalized intakes for the third approach. Results: Combined factor and cluster analyses yielded three patterns: sandwiches, fast food and prudent. Cluster analysis alone yielded three patterns: prudent, sandwich and Midwestern. Cluster analysis alone resulted in high-fat, prudent, and sandwich patterns. ‘Sandwich’ and ‘prudent’ patterns were common to all approaches; the ‘fast food’, ‘high-fat’ patterns were unique to only one approach.
Conclusions: Although two dietary patterns were common to all approaches, each one identified a pattern uncommon to the others. Future work should explore the properties of these methods in data sets with known dietary patterns, such as through simulation studies.

T-867-P
Waist-to-Height Ratio – A Better Index Than BMI to Diagnose Obesity & Estimate Body Fat
Grant Zhao Sugar Land, TX
Background: Body mass index (BMI) is the most widely used measure to diagnose obesity. However, it is simply scaled from body weight and contains less information about excess body fat distributions. The waist-to-height ratio (WHR), instead, has potential to be a better indicator of excess fat.
Methods: Using US population survey data (NHANES 1999-2004), a total of 12,381 subjects (age 20-85 years, 6320 men and 6261 women) were used for comparative statistical analyses, including sensitivity and specificity in diagnosing BF%>25% and 35% obesity, WHR showed a sensitivity of 96% in men and 92% in women vs. BMI’s sensitivity of 37% in men and 44% in women; (ii) Univariate regression analysis showed WHR has better correlations with BF% than BMI in men (WHR R2=0.72 vs. BMI R2=0.54) and almost equal in women (WHR R2=0.595 vs. BMI R2=0.600); (iii) A new multivariate regression model based on logarithms of weight (Wt), height (Ht), waist circumference (WC), and age demonstrated superior performance to estimate BF% in various statistical metrics (R2=0.75, SSE=3.03, Sensitivity=0.93, Specificity=0.74 in men; R2=0.70, SSE=3.59, Sensitivity=0.95, Specificity=0.67 in women) compared to the BMI-based model by Jackson et al. (R2=0.65 and SSE=4.73 in men and R2=0.66 and SSE=5.93 in women). Conclusions: WHR performed significantly better than BMI as an index in diagnosing obesity. A multivariate regression model including WHR showed improved performance compared to a commonly used BMI-based regression model for BF% estimation. These results can be helpful in both diagnosing obesity and predicting BF%.

T-868-P
Coordinating Sensor and Subjective Data in mHealth Studies
Jared D. Sieling St Louis Park, MN; Dale Bond, Graham Thomas Providence, RI; Jon Moon St Louis Park, MN
Background: In research to understand and influence behavior, a key use of objective sensors should be to offload burden from participants - freeing them to provide valuable subjective and timely responses. Data from multiple sensors must be integrated during over extended periods. Methods: To support behavioral studies we are building a flexible data management system. It automates acquisition, quality assessment, initial processing, imputation and segmentation, and presentation from multiple disparate sensors in real time. Analysis can be generalized as applying processing to continuous time series (accelerometers and other streams), periodic (inputs triggered by time), and asynchronous data (triggered by device or user status, location patterns). Multi-tasking smartphone can perform preliminary processing sufficient to prompt subjective actions and responses. Results: The system is supporting current trials. One at Brown University is a cross-over study on 40 patients after bariatric surgery. It examines the timing and content of motivational messages delivered to promote PA after durations of inactivity for 3 weeks. Raw acceleration data recorded with a smartphone is processed in 1 min epochs to PA criteria which trigger requests to the participants and display progress indicators. All the data are uploaded every 30 min and integrated to provide the researcher with a view of phone/software status, subject actions, and compliance. The remote system reconfigures the smartphone software at cross-over and applies updates. The process, including data uploads, has been successful for thirteen participants enrolled. Conclusions: Researchers need systems that allow them to integrate disparate sensor, software and algorithms that minimize burden on participants.

Population Health - Other
T-869-P
Assessing Consumer Acceptability and Purchase Intent of Sugar Reformulated Foods
Oonagh Markey, Julie A. Lovegrove, Lisa Methven Reading, United Kingdom
Background: Over the past fifty years, global consumption of sugar has increased three-fold; this trend is mirrored by rising levels of obesity and its co-morbidities. Reformulation of sugar-containing processed foods is considered a promising vehicle for reducing sugar intake. This study evaluated consumer acceptance and purchase intent of sugar-reduced reformulated products, when compared to their unmodified counterparts. Methods: A se-
ries of five unbranded paired (unmodified and reformulated) commercially available baked beans (BB), milk chocolate (MC), cola drink (CD), cranberry juice and strawberry jam (SJ) product samples were presented to 116 healthy, non-smoking consumers (55m/61f, age 33±9 years, BMI 25.7±4.6 kg/m²) in a double blind, balanced randomized order. Hedonic category scales were employed to assess consumer liking (9-point scale), purchase intent (5-point scale) and product replacement (5-point scale) ratings for each of the 10 samples. Results: Significantly higher mean ratings of liking, purchase intent and product replacement were evident for unmodified BB, MC and CD samples. Hierarchical cluster analysis of consumer liking data identified three consumer clusters. One cluster (28% of consumers) had no significant difference in their liking of all of the unmodified and reformulated products. Cluster three (45%) rated all reformulated products significantly lower than unmodified products, except for SJ. Conclusions: This research suggests that reformulated products may be an accepted vehicle to reduce sugar consumption by some consumers. However, improvements need to be made to sensory qualities of reformulated products before they will be accepted by all consumers, and the effects of branding on the reformulated products must also be considered.

T-870-P
Contribution of Maternal Overweight and Obesity, Excessive Gestational Weight Gain and Gestational Diabetes Mellitus to Large Birth Size, Florida 2004-2008
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Background: Individual effects of maternal body mass index (BMI), gestational weight gain (GWG), and gestational diabetes (GDM) on fetal growth are well documented. However, timing and complexity of interventions aimed at reducing these risks differ and few studies describe the potential impact on large-for-gestational age (LGA) infants if one or more of these risks is removed. We estimate the percentage of LGA infants attributable to these risk factors—both individually and in combination—across different race/ethnicity groups. Methods: We analyzed 2004-2008 linked birth certificate and maternal hospital discharge data of live, singleton deliveries in Florida. We used logistic regression to assess the independent contributions of mother’s prepregnancy BMI, GWG, and GDM status on LGA (birth weight-for-gestational age >90th percentile) risk, by race/ethnicity, while controlling for maternal age, nativity, and parity. We then calculated the adjusted population attributable fraction (PAF) of GDM cases attributable to each of these exposures. Results: LGA prevalence was 5.7% among normal weight women with adequate GWG and no GDM. Among women with GDM, excess GWG, and BMI ≥25, LGA prevalence was 17.3%, 13.5% and 12.6%, respectively. Depending on race/ethnicity, a reduction of 46.8% to 61.0% in LGA prevalence would result if women had none of the three exposures. For all race/ethnicity groups, GDM contributed the least to LGA with PAF ranging from 2.0% to 8.0% and excessive GWG contributed the most (33.3% to 37.7%). Conclusions: Overweight and obesity, GDM and excessive GWG all contribute to LGA; however, preventing excessive GWG has the greatest potential to reduce LGA prevalence. Weight management strategies during pregnancy are warranted.

T-871-P
Association of Childhood Obesity and Bisphenol-A: Role Played by Race, Birth Weight and Maternal Smoking During Pregnancy
Sunil Mathur, Akhilesh Kaushal Memphis, TN
Background: The prevalence of childhood obesity has more than doubled in children (2-11 years old) and tripled in adolescents (12-19 years old) in past 30 years. Bisphenol-A (BPA), a chemical, can be present in many consumer products, including polycarbonate water bottles and food storage boxes. Several studies have shown that prenatal and early postnatal BPA exposure is associated with increased body weight and fat deposition in children. There is a pressing need to possess a clear understanding of the link between BPA and childhood obesity. This study explores the association of BPA and obesity among children and examines the moderating role of birth weight, race and maternal smoking during pregnancy. Methods: This study uses National Health and Nutrition Examination Survey (NHANES) 2009-2010 dataset in which 387 respondents, out of 1878 respondents, were obese (>95th percentile, age and sex specific). We used multivariate statistical analysis to analyze the data. Results: The childhood obesity was significantly associated with BPA, and birth weight, race, mothers’ smoking status during pregnancy (p value < 0.0001). Non-Hispanic whites respondents with birth weight between 2300 and 4100g, and Urinary-BPA greater than 5.4 ng/mL had very high chance (odds ratio=5.19, p value < 0.0048) of becoming obese. Respondents whose randomized during pregnancy had higher urinary-BPA at 1.5-2.7 mg/mL had high chance of becoming obese (odds ratio=1.56, p value<0.0001). Conclusions: There is a clear association between childhood obesity and BPA which necessitates designing of specifically tailored intervention programs for different races and for effectively controlling exposure to BPA and maternal smoking during pregnancy.

T-872-P
The Utility of BMI Percentile to Identify Cardio-Metabolic Risk among Middle School Students
Katherine W. Bauer Philadelphia, PA; Marsha D. Marcus Pittsburgh, PA; Laurie El Ghorani Washington, DC; Cynthia L. Ogden Hyattsville, MD; Gary D. Foster Philadelphia, PA
Background: Although body mass index (BMI) is positively correlated with cardio-metabolic risk among children, there is a paucity of research exploring the utility of BMI as a screening tool to identify youth with elevated cardio-metabolic risk factors. The purpose of this study was to determine the optimal BMI percentile cut points associated with increased cardio-metabolic risk in a select sample of low-income, multi-ethnic, middle school-aged children from 42 schools. Methods: A cross-sectional analysis of data from 6097 youth ages 10-13 who participated in the baseline assessment for the HEALTHY study was conducted. Receiver operating characteristic curves were used to determine the discriminatory ability of BMI percentile to identify children with elevated risk factors. Results: BMI percentile performed from poor to fair (Area Under the Curve (AUC) .57 to .75) in identifying youth with elevated glucose, total cholesterol, low-density lipoprotein, blood pressure, triglycerides, and high-density lipoprotein, and 1 or 2 risk factors. Discriminatory ability was good (AUC > 0.80) for the outcomes of elevated insulin and clustering of ≥3 risk factors, with optimal BMI percentile cut points of 96 and 95 respectively. The positive predictive values at these cut points were low (21.6% and 18.4% respectively). Conclusions: The current definition of obesity among children (BMI percentile ≥ 85) performs well at identifying youth with elevated insulin and ≥3 risk factors, although a large number of youth without current cardio-metabolic risk will be identified using this definition. BMI percentile did not exhibit high discriminatory ability for the majority of risk factors examined. Future studies are needed to explore whether alternative screening methods can better identify youth with current cardio-metabolic risk factors.

T-873-P
Developmental Trajectories of Body Mass Index from Birth to 18 Years of Age: Prenatal and Postnatal Determinants
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Background: Although the epidemic of obesity and overweight among children and adolescents is substantial, our understanding of their developmental trajectories is limited. Our objective was to identify trajectories of body mass index (BMI) from birth to 18 years of age and assess their associations with prenatal and postnatal exposures. Methods: Participants of the Isle of Wight birth cohort (n = 1,456) were assessed at ages 1, 2, 4, 10, and 18 years. A semiparametric mixture model was applied to identify BMI trajectories. Multinomial logistic regression was used to estimate associations between prenatal and postnatal exposures and BMI trajectories. Results: Four BMI trajectories were identified: normal, early persistent obesity, delayed overweight, and early transient overweight. The early persistent obesity trajectory was characterized by childhood obesity that persisted into late adolescence. In contrast, the delayed overweight trajectory showed increasing trend and crossed the overweight threshold at age 10. Maternal pre-pregnancy overweight and gestational smoking were associated with the early persistent obesity trajectory (OR = 3.80 and OR = 2.70, respectively) and the delayed overweight trajectory (OR = 2.86; and OR = 1.95, respectively). Elevated birth weight (> 4.0 kg) was associated with the early transient overweight trajectory (OR = 1.76). A reduced risk for the early transient overweight trajectory was seen for breastfeeding ≥ 24 weeks (OR = 0.55). Conclusions: Modifiable prenatal and early postnatal exposures are important factors in

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priming long-term trajectories of BMI. The four BMI trajectories were initi-
ated and can be identified in the first four years of life. Therefore, prevention
and intervention efforts should target the first four years of life when patterns
of BMI are set until adult life.

T-874-P
Accelerometer Determined Sedentary and Light Physical Activity Levels and Depot-Specific Adiposity
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Background: This analysis investigated associations of accelerometer-deter-
mined sedentary time and LPA with abdominal visceral (VAT) and subcuta-
neous (SAT) adipose tissue and total fat mass (FM). Methods: Overall, 88
non-obese (mean: 22.9 kg/m2) adults, aged 20-36 (mean: 27 y) wore an Acti-
graph GT3X accelerometer for 1 week and sedentary (<100 counts/min), LPA (500-2019 counts/min) and moderate-to-vigorous physical activity (MVPA; ≥2020 counts/min) variables were derived. VAT and SAT areas and FM were estimated from DXA (Hologic QDR4500, Bedford, MA) using recen-
tly validated Apex 4.0 software. Associations between sedentary time, LPA and depot-specific adiposity were assessed using general linear models. Model 1 included age, race and accelerometer wear-time. Model 2 also in-
cluded body mass index and MVPA as covariates. Results: Sedentary time was positively associated with SAT (Model 1; β = 0.21; p = 0.099) and VAT (Model 1; β = 0.27; p = 0.044) and LPA was inversely associated with SAT (Model 1; β = -0.63; p = 0.017). Model 2; β = -0.42, p = 0.048) in males only. Neither sedentary time nor LPA was associated with VAT. Sedentary time was posi-
tively associated with FM in both males (Model 1; β = 0.19; p = 0.053) and females (Model 1; β = 0.03; p = 0.035). Model 2; β = 0.02; p = 0.020). LPA was inversely associated with FM (Model 1; β = -0.03; p = 0.039) in males. 

Conclusions: Associations between sedentary time and SAT in males and sedentary time and FM in females persisted, even after controlling for MVPA.

T-875-P
Food Reinforcement Pathology: Demand for Food and Delay Discounting Interact to Predict BMI in Female Family Shoppers
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Background: Food reinforcement and delay discounting represent concur-
rent versus intertemporal aspects of choice that are independently related to obesity. Recent research suggests that these two processes interact to predict energy intake and weight loss, which has been labeled food reinforcement pathology. However, no research has yet examined whether food reinforce-
ment pathology predicts BMI, and whether delay discounting is the only measure of impulsive decision making that interacts with food reinforcement. Methods: The relative reinforcing value of high (RRVHVED) and low-energy dense food (RRVLLED), delay discounting of $10 (DD10) and $100 (DD100) re-
ward values, and response inhibition, using the GoStop impulsivity para-
digm, were measured in a sample of 198 female shoppers of varying BMI levels. Results: Results showed that RRVHVED (p = 0.017), DD10 (p = 0.004) and DD100 (p = 0.003) were independent predictors of BMI. In addition, RRVHVED interacted with DD10 (p = 0.02) and DD100 (p = 0.003) and RRVHVED interacted with DD100 (p = 0.01) and DD10 (p = 0.003) to predict BMI, control-
ling for age, education, and self-report measures of disinhibition and di-
etary restraint. No independent effects or interactions with response inhibition were observed. Conclusions: This study provides additional support for the construct of reinforcement pathology as important for obesity.

T-876-P
Maternal Obesity: Shifting the Context of Fetal Growth and Early Life Programming of Obesity
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Background: Maternal obesity stimulates numerous alterations to fetal de-
velopment that can result in either small or large birth size, both linked to early life programming of obesity. Furthermore, physiologic dysfunction in-
duced by maternal obesity may alter the etiology of other fetal growth restric-
tion processes. Maternal obesity may compete with or magnify the effects of traditional risk factors for small birth size, but such interactions have not been studied. Methods: We used data from the Oregon Pregnancy Risk As-
essment Monitoring System (2004-2007; n=6,302) and linked birth records.

Using multinomial logistic regression, we estimated effects of two known risk factors for fetal growth restriction (prenatal smoking and gestational hy-
pertension) on small- or large- (compared to appropriate) for gestational age (SGA, LGA, AGA) within pre-pregnancy BMI categories (underweight, nor-
mal weight, overweight, obese class I, obese class II-III). Models excluded women with gestational diabetes or multiple births and controlled for preg-
nancy weight gain, parity, and sociodemographic characteristics. Results: Prenatal smoking and gestational hypertension were associated with elevated risk of SGA in normal and overweight women [Odds Ratio (OR) (95% CI) range 2.0 (1.4, 4.5) to 5.1 (2.6, 10.0)]. Gestational hypertension, but not smoking, also predicted elevated SGA risk in women with class II-III obesity [OR (95% CI): 4.9 (1.8, 13.0)]. Prenatal smoking and gestational hyperten-
sion were negatively associated or unrelated to LGA at all BMI levels. 

Conclusions: Extreme maternal obesity and gestational hypertension may in-
duce common processes leading to SGA, while competing fetal under- and
over-growth may be involved in smoking effects and in LGA. Investigation of physiologic mechanisms that underlie these associations is needed.
largely centered on non-formal, self-directed learning. Little variation was seen in self-identity; weight loss was perceived primarily as a physical transformation motivated by health and vanity. Challenges surfaced regarding critical reflection on cultural/social factors; a pivotal aspect to perspective transformation. Majority of participants continue to engage in the dominant discourse, little acknowledgement to the role of advertising, and participants continued to have an obesity positionality with overtones of personal responsibility. Conclusions: This study offers theoretical implications for adult learning and practical implications for strengthening subsequent intervention design.

T-879-P
Pre-Health Professionals’ Perceptions of Overweight and Obesity
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Background: Clinical definitions of underweight (BMI < 18.5), normal weight (BMI 18.5 – 24.9) overweight (BMI 25.0-29.9), and obese (BMI ≥ 30.0) are clearly delineated by the World Health Organization and Centers for Disease Control and Prevention. This study explored perceptions of overweight and obesity among undergraduate students in health-related majors. Methods: Participants (n = 261), as part of a larger study, were asked to report their current height and weight, and the weight at which someone of their height would be considered (a) overweight and (b) obese. Results: Based upon self-reported height and weight, 17.7% of participants had BMI values classified as overweight, 68.8% as normal, 26.3% as overweight and 4.2% as obese. Weights reported as overweight for someone of their height would result in 23.7% of participants being classified as normal weight, 55.7% as overweight, and 20.5% as obese. Weights identified as obese for someone of their height would result in 2.4% of participants being classified as overweight and 37.5% as overweight and 60.1% as obese. Participants’ weight status was associated with their definitions of overweight and obesity; participants with lower BMIs identified lower weights for overweight and obese than those with higher BMIs (p < .001). Conclusions: Discrepancies exist between pre-health professionals’ perceptions of overweight and obesity and clinical definitions (i.e., BMI). Significant proportions of participants both under- and over-estimated the weight at which someone of their height would be overweight. A significant percentage underestimated the weight at which someone of their height would be obese. Additional research is needed to determine the mechanisms underlying the inaccuracy of weight classification and to explore the potential implications such misclassifications may have in health and fitness settings.

T-880-POT
Adipocytokines and Obesity-Related Hormones Profiling in Africans
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Background: Despite the increasing prevalence of obesity and its co-morbidities in Africa, most of the research activities in African populations remain focused on infectious diseases. This singular focus on communicable diseases has led to a poor understanding of the scope and determinants of non-communicable diseases such as obesity and diabetes in African populations. Here, we present the first study to systematically investigate the concentrations of adipocytokines and hormones in Africans and to determine their associations with obesity. Methods: We measured 11 adipocytokines and hormones in 920 Africans using the BIO-Plex array from Bio-RAD. Spearman’s rank correlations was used to assess the associations between Body mass index (BMI), Waist circumference (WC) and percentage fat mass (FFM), and the measured biomolecules. Categorical analyses were performed to investigate the association between these biomolecules in non-obese (BMI< 30 kg/m2) and obese (BMI≥30 kg/m2) individuals; the medians between the two groups were compared and tested by Mann-Whitney U test. Results: The prevalence of obesity in this study was 22%. All 3 obesity measurements were positively associated with all adipokines and hormones except glucagon, resistin, and visfatin. Insulin was positively associated with GIP, GLP-1, leptin, PAI-1, visfatin and adipins. GLP-1, leptin, PAI-1, adipin, insulin and C-peptide were statistically higher in obese than non-obese. Conclusions: The results of this study suggest a positive relationship between adiposity and serum adipokines and hormones that are not only related to obesity but also to type 2 diabetes in other populations. Further investigations are needed to better understand the biological significance of these associations in Africans.

T-881-P
The Association of “Food Addiction” with Body Mass Index and Pathological Eating in a Community Sample
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Background: Evidence is growing that addictive processes may be involved in the development of obesity and disordered eating behavior. However, the current literature has examined these relationships in non-clinical samples composed of normal weight participants or in samples in which all participants were obese. This novel study examined the association of “food addiction” with body mass index (BMI) and eating psychopathology in a large community sample. Methods: Eight-hundred and thirteen participants were recruited from online advertisements nationwide. Participants completed measures related to “food addiction”, BMI, weight history, and disordered eating. Results: Addictive-like eating was associated with elevated current/lifetime BMI and eating pathology, including frequency of binge eating and purging. “Food addiction” continued to be related to clinically relevant variables even outside of the context of other eating disorders, especially elevated BMI. The co-occurrence of “food addiction” with eating disorders appears to be associated with a more severe variant of eating pathology. Conclusions: These results suggest that an addictive-type response to highly palatable food may be contributing to eating-related problems, especially obesity and binge eating. Further examination of “food addiction” may be important in understanding and treating certain types of problematic eating behavior, such as high rates of relapse following weight-loss treatments in obesity.

T-882-P
The Contribution of Emotional Eating and Emotion Regulation to the Prediction of Binge Eating and Weight Status
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Background: Research suggests that emotion regulation deficits may contribute to the tendency to overeat in response to negative affect (Whiteside et al., 2007), yet virtually no studies have examined possible mediation by emotion regulation in the relationship between negative affect and binge eating and weight status. Methods: Undergraduate students (n=614) completed an online survey that included assessment of self-reported height and weight, binge eating (Questionnaire of Eating and Weight Patterns-Revised), emotional eating (Emotional Eating Scale: EES), and emotion regulation (Difficulties in Emotion Regulation Scale: DERS). Logistic regression analysis was used to test emotion regulation (DERS score) mediated the relationship between (a) emotional eating and binge eating and (b) binge eating and BMI. Results: Emotional eating was significantly and positively associated with BMI (r = .092; p<.05), binge eating (r = .326; p<.01), and the DERS (r=.33; p<.01). Emotion regulation partially mediated the relationship between emotional eating and binge eating, collectively accounting for 20% of the overall variance in binge eating in the final model. The DERS did not, however, mediate the relationship between binge eating and BMI. Although binge eating did significantly predict BMI, it contributed to just 1.9% of the overall variance. Conclusions: Findings suggest that negative affect and deficits in emotion regulation significantly contribute to binge eating. Given the well-documented relationship between binge eating and obesity, however, future research should explore more complex models to better understand how and under what conditions emotion regulation and emotional eating may interact to impact weight, either through binge eating or via some other mechanism.
T-883-P
Weight Loss in a Health Care System: A Population Health Approach
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Background: Aurora Health Care® is an integrated health system with over 30,000 employees serving 31 counties and 90 communities. Employee Wellness Initiatives include smoke-free campuses, HRA’s, preventative care, healthier cafeteria options, and mandatory flu shots. Given that obesity negatively impacts employee health and health plan costs as well as the ability to model healthy behaviors, the 2013 focus was on lowering employees’ BMI.

Methods: 62% (n=17,704) of Aurora employees were screened for BMI by April 2013. The 35.3% with a BMI ≥30 kg/m² were offered an incentive on health care premiums if they joined 1 of 5 weight-loss options. This study assessed the initial outcomes of 2 Health Management Resources® (HMR®) programs that were offered: a clinic and a phone program (HMR/Healthy Solutions® at Home). Data reported reflect the first 14 weeks of both of these ongoing treatment programs. The clinic achieved greater average weekly weight losses than the phone program (2.7 vs. 2.2 lbs). Nearly four times more employees, however, were participating in the phone program at week 14. Participants in both options were highly compliant with weekly attendance: average 97.1% in clinic, 89.6% in phone. Both options reported substantial changes in lifestyle behaviors: 100% of clinic and 89.6% of phone attendance: average 97.1% in clinic, 89.6% in phone. Both options reported week 14. Participants in both options were highly compliant with weekly attendance: average 97.1% in clinic, 89.6% in phone. Both options reported substantial changes in lifestyle behaviors: 100% of clinic and 89.6% of phone patients were eating a 35 full-cup servings of fruits & vegetables/wk. Clinic patients reported greater average physical activity (3334 vs 1683 kcal/wk). Aurora estimated the implementation of a high impact wellness program (including lowering BMI) would avoid $97,987,691 in costs over 6 years.

Conclusions: Employers concerned about the impact of obesity on health-care costs are incenting employees to manage their weight. Programs that are offered must demonstrate effective weight-loss outcomes in order for health and economic objectives to be reached.

T-884-P
Micro-Analysis of Mother-Toddler Feeding in the Home Environment
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Background: About one in four U.S. children two to five years old are overweight or obese. Evidence supports the importance of the mother-child dyad as a focus for investigation; however, limited research has focused specifically on maternal-toddler feeding interactions, focusing instead on infants (<12 months of age) and school age children. Purpose: To describe a new approach to coding and micro-analysis of mother-toddler feeding interactions in the home environment. Methods: A sample of mothers of children 1-3 years of age (n=7) were provided with small, tripod mounted video cameras and asked to record at least 6 feeding episodes over the course of a week. Each mother collected approximately two hours of usable videos of 6 or more feeding interactions. Results: Videos were reviewed and discrete interaction episodes (n=202) were identified. Both mother and child behaviors within each interaction segment were coded using 18 categories of behavior (e.g., offers food, pout,喔, pretends to eat) for mothers and 12 categories of behavior for toddlers (e.g., crying, eating, playing with food). The emotion of the mother and toddler were coded as positive, negative or neutral for each episode. Temporal information was captured allowing us to estimate the length of each interaction segment. A Visual Basic program was developed to create transitional probability matrices for sequential analysis. Matrices are generated describing mother behavior and child response, and child behavior followed by mother response. Mother-toddler behavior patterns are identified by examining transitional probabilities that differ significantly from behavior base rates. Conclusions: It was possible to collect, code, and analyze mother-toddler feeding interactions to identify mother behaviors associated with successful and unsuccessful child feeding strategies.

T-885-P
Prevalence of Healthy Weight Maintenance and Reversal of At-Risk Weight Patterns During School-Age: A Longitudinal Analysis from the ECLS-K Cohort
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Background: How often early childhood obesity is “reversed” in later childhood has received limited study despite a growing epidemic. Characteristics associated with favorable growth patterns such as healthy weight maintenance (HWM) or return to healthy weight (RHW) could provide insights into potential protective factors surrounding childhood obesity. We thus sought to describe the proportion of pre-puberlal children demonstrating these growth patterns during school-age. Methods: We analyzed a nationally representative cohort with child height and weight data from K-5th grades (n=9,416). Measures included BMI, race/ethnicity, gender and socio-economic status (SES). BMI patterns were identified and described using 4 data waves (grades K, 1st, 3rd and 5th) and categorized as 1) HWM: BMI ≥5th to <35th percentile at every wave and, 2) RHW. BMI ≥5th (“at-risk”) in prior wave with subsequent transition to healthy weight. Analyses were weighted according to ECLS-K procedures. Results: Among school-age children, 48% had a HWM growth pattern and 17% of those at-risk in a prior wave (27% of entire sample) had a RHW pattern. In addition, 18% transitioned from healthy to at-risk, 3% transitioned from healthy to underweight and 3% were overweight always/almost always between K-5th grade. Background characteristics associated with HWM included being female and being white (all p’s <0.005) which persisted after controlling for SES. There were no background characteristics associated with RHW. Conclusions: Less than 1 in 5 at-risk children are able to “outgrow” their weight risk. HWM is the most prevalent growth pattern during school age. Future work should explore additional individual, contextual and behavioral factors associated with weight trajectories including favorable growth patterns such as return to healthy weight.

T-886-P
Obesity Is Negatively Associated with Sarcopenic Obesity in Chilean Older People
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Background: Several studies have underlined the significance of sarcopenic obesity in older people raising both metabolic and functional risks. The aim of the present study is to determine the frequency of sarcopenic obesity and its association with nutritional state in Chilean older adults. Methods: Cross-sectional study in 753 community-living subjects (66.9% women) aged 61-99 years (mean ± SD: 71.5 ± 7.0 years) residing in Santiago, Chile. Physical performance, anthropometry, dynamometry and dual-energy x-ray absorptiometry (DXA) scan were performed. Participants were classified as sarcopenic using the skeletal muscle mass index (SMMI), calculated as appendicular skeletal muscle mass/height^2 (kg/m²) based on sex-specific lowest 20%. Sarcopenic obesity was defined as being over the 60th percentile of fat mass (%≥32% in men and ≥44% in women) and under 20% of SMI (7.1 kg/m² in men and 5.6 kg/m² in women). Results: The frequency of obesity was 32.3% and abdominal obesity 54.1%. Sarcopenia was present in 29.2% of the sample with a decreasing trend according BMI categories: 66.8% in people with BMI≥25, 26.3% in overweight people and 4.9% in obese (p<0.001). Sarcopenic obesity was present only in 5.7% of the sample from which 24% had sarcopenic obesity. From the total of sarcopenic subjects (179), 24% were identified as sarcopenic obesity. After logistic regression the age, gender and mobility adjusted OR of having sarcopenic obesity was associated negatively with obesity (OR= 0.18; 95%CI 0.05-0.67, p<0.01). Conclusions: The results demonstrate a negative association of obesity with sarcopenia. Moreover, obesity is negatively associated with sarcopenic obesity in Chilean older people. Funded by FONIS Grant SA1212337
T-887-P
Osteoporosis, Oxidative Stress and Body Fat Distribution in Chilean Older People
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Background: Oxidative stress is a risk factor for osteoporosis. Our aim is to evaluate the relationship between presences of osteoporosis/osteopenia, biomarkers of oxidative-antioxidative stress (OAS) and fat mass (FM) distribution. Methods: Cross-sectional study of 229 subjects (70.7% women) of medium-high socioeconomic level from Santiago, aged 60-83y. The subjects were recruited to determine osteoporosis/osteopenia and its components according to FM. Body composition was determined by dual-energy x-ray absorptiometry (DXA). To classify people as having OAS were measured reduced-glutathione (GSH), thiobarbituric-acid-reactive substances (TBARS) and conjugated-dienes (CD) as well as enzymatic-activity of superoxide-dismutate (SOD), catalase (CAT), glutathione-S-tranferase (GST) and gluthathione-peroxidase (Gpx). The relationship between Android and Gynoid fats and biomarkers of OAS was studied through Canonical Correlation (CC). Association between presence of osteoporosis/osteopenia with OAS and FM was estimated by logistic regression. Results: Osteoporosis/osteopenia was presented in 60.4% of the subjects (67.6% women). FM correlated negatively with SOD and CAT. The linear-combinations for CC showed positive association for Gynoid fat and negative for Android fat with GSH (CC=0.28), GST (CC=0.18) and TBARS (CC=0.13). After adjustment for age, sex and BMI, the presence of osteoporosis/osteopenia is associated with HPT (OR=0.89; 95%CI:0.80-0.99) and Gynoid fat (OR=1.24; 95%CI:1.07-1.44). Conclusion: These results suggest that osteoporosis/osteopenia is closely related with the increment in Gynoid fat. On the other hand, osteoporosis/osteopenia was associated to antioxidative stress suggesting that is due to a response from the organism to the high concentration of several oxidative markers that were related with the Gynoid fat in Chilean older people.

T-888-P
Simple Cooking with Heart: Nutrition Education and Improving Diet Quality Through Culinary Skill-Based Education
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Background: Meals eaten away from home, particularly at fast-food restaurants, tend to have more calories, saturated and trans fats, and sodium and fewer fruits, vegetables, and whole grains than meals prepared at home, this contributes to higher body mass indexes in children and adults. The objective of the American Heart Association’s Simple Cooking with Heart program is to improve the diet quality of Americans through increased consumption of home-prepared meals with culinary skill based nutrition education providing tools, recipes, instruction and basic skill building for preparing low-cost, heart healthy meals. The theoretical framework for this program is based upon the Socioecological Model and Social Cognitive Theory of behavior change, both proven to be successful in diet and lifestyle interventions. Primary program targets are low-income families, specifically women (mooms) ages 25-62. The program includes experiential skill acquisition through “live” cooking demonstrations and a robust program website which includes tools, low cost recipes and instructional skill videos. Methods: A third party employed to study programme attendance. It contributes to an emerging theoretical model of how awareness of and psycho-social reactions to stigma influence weight control actions.

T-889-P
Understanding the Impact of Obesity Stigma on Weight Control Actions: Development of the Thoughts about Body Size (TaBS) Measure in England
Ian Brown, Stuart W. Flint, Chris Stride, Karen Kilner Sheffield, United Kingdom
Background: Patient non-attendance to weight control programmes after referral is an important problem. The influence of obesity stigma should be investigated further. The Thoughts about Body Size (TaBS) Study aimed to develop and validate a short questionnaire suitable to facilitate patient assessment and further research about attendance variables. Methods: In depth interviews with 52 patients mean age 56.9 years and all with BMI > 30 identified aspects of sensitivity to obesity stigma influencing weight control actions. Question stems (items) covering these issues were developed and reduced over several iterations. The final TaBS questions were employed in population (n = 237) and treatment attending (n = 133) samples (overall n = 370; mean age 53.99; mean BMI = 36.14; women 64%). Results: Three distinct subscales emerged: Sensitivity (six items, Cronbach α = 0.91); Resistance (3 items, α = 0.75) and Opposition reaction (3 items, α = 0.73). These were correlated (0.22 - 0.49) but not overlapping constructs. The TaBS Measure was related with age in both samples (older adults less sensitive) but otherwise relationships differed between samples. Conclusions: The TaBS Measure shows promising psychometric properties and potential to be employed to study programme attendance. It contributes to an emerging theoretical model of how awareness of and psycho-social reactions to stigma influence weight control actions.

T-890-P
Nutritional Intake, Overweight and Obesity among Person’s Living with HIV/AIDS in Atlanta Georgia
Dominica B. Hernandez, Seth Kalichman Storrs, CT
Background: Overweight and obesity is becoming more prominent in person’s living with HIV/AIDS (PLWHA). The aim of this study was to examine nutritional intake, body weight and body composition in PLWHA in Atlanta Georgia. Methods: PLWHA were recruited from a holiday food basket charity in Atlanta Georgia. Participants (n = 533; 158F, 354M) were asked to partake in this study upon picking up their basket; baskets are given out annually. Intakes of fiber, percentage of fat and fruit and vegetables were measured using the Multifactor Screener, body composition and body weight were measured using a Tanita BIA scale. HIV status was self-reported. Results: Body composition and body weight were collected on 468 participants (137F, 478M); 27% of the participants were overweight [BMI >25 kg/m²], with 29.1% obese [BMI >30 kg/m²]. More females were overweight and obese than males (p=.000, ν²=1.38). Percentage of fat was comparable for both males (M=37.79, SD=4.9) and females (M=37.09g, SD=5.19); however, males had a higher intake of fiber (M=19.07g, SD=11.26) and servings of fruits and vegetables (M=2.26, SD=1.14) than females (M=15.68, SD=8.39; M=2.0, SD=1.06), respectively. Overall, all participants daily fat percentage intake were shown to be above national recommended standards of 30%; fiber was found to be below 20g; and fruits and vegetables were also shown to be below 5 servings. Conclusions: Results suggest that overweight and obesity may be affecting PLWHA in Atlanta Georgia. Nutritional analysis suggests PLWHA may not be meeting their recommended nutritional standards, which may be detrimental to the care of these individuals.

T-891-Pdt
Prevalence of Overweight in Deaf Children and Adolescents Living in the Midwest
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Background: Children and adolescents with special needs and disabilities are at increased risk for overweight in comparison to youths without disabilities. Currently, minimal research has explored the prevalence of overweight among deaf children and adolescents. Methods: Anthropometric and demographic data were collected from 544 students (M age = 13.91 yrs, SD = 4.02, range 9 - 19) attending schools specifically for deaf children and adolescents in 4 Midwest states (i.e., Illinois, Minnesota, Kansas, Missouri). Body Mass Index (BMI) z-scores were calculated from anthropometric data and used in analyses. Prevalence of overweight and obesity in the sample and

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factors related to prevalence were explored. Results: Average BMI z-score for the sample was .38 (SD = 1.13), corresponding to the 60.84 percentile. Overweight youth comprised 15.26% of the sample, and 2.21% were obese. BMI z-scores were related to state of residency, F (3, 540) = 3.10, p = .03, and gender, F (1, 542) = 5.43, p = .02. Rates of overweight were lower among males and students living in Minnesota. BMI z-scores were not related to student age, ethnicity, or residence (i.e., on or off campus housing).

Conclusions: Results suggested that deaf children and adolescents attending a specialized school for the deaf are at less risk for obesity than the national average. Although the prevalence of overweight and obesity differs by state of residency. Males were also less at risk for overweight than females. Results indicate that attending a state school for the deaf does not seem to increase the rates of pediatric obesity as has been found in other special needs populations.

T-892-P
Say It Isn’t Soda? Maternal Sugar-Sweetened Beverage Intake During Pregnancy Is Positively Related to 4-6-Year Old Children's BMI Z-Score
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Background: Maternal diabetes and over-nutrition have been associated with increased risk of childhood obesity. Consequently, studying the relationship between maternal intake of sugar-sweetened beverages during pregnancy and childhood obesity is warranted. Methods: Mothers, whose children (n=81, mean ± SD age = 5.04 ± 0.77 y.) participated in 4 multi-item test meals, reported food and beverage intake during pregnancy as well as intake for their children using food frequency questionnaires. Mother’s self-reported height and weight was converted into maternal BMI (means SD = 29.01 ± 6.97 kg/m2). Children’s anthropometrics were measured and converted into child BMI z-score (means SD=1.0 ± 1.02). Secondary analyses are reported using linear regressions, with child BMI z-score as the dependent variable and mother’s reported sugar sweetened beverage (SSB) and soda intake during pregnancy as independent variables. Models were adjusted for ethnicity and maternal BMI. Results: Maternal SSB intake during pregnancy was positively associated with child BMI z-score at age 4-6 years (p=0.02). Inclusion of maternal BMI resulted in stronger prediction of child BMI z-score (p<0.004), though maternal SSB intake was no longer significant (p=0.26). Maternal soda intake during pregnancy was a stronger predictor of child BMI z-score (p=0.02) than child’s soda intake. Again, maternal BMI inclusion (p=0.004) removed the effect due to maternal soda intake (p=0.50).

Conclusions: Nearly half of mothers (48.8%) consumed soda during pregnancy. Determining the causal relationship between maternal intake of SSB during pregnancy, maternal BMI and child weight status is important for understanding the impact of maternal diet on future development of obesity in children.

T-893-P
To Eat It or Not to Eat It: Why is the Question: How Do Adolescents Perceive “Healthy Food”?
Stephanie Hasty, Eliana M. Perrin, Ashley C. Skinner Chapel Hill, NC

Background: Efforts to tackle the growing epidemic of childhood obesity typically focus on the need to maintain a “healthy” diet, but how adolescents perceive and understand “healthy” is not well studied. Our objective was to examine the perceptions of adolescents about which foods they perceive as “healthy” and “unhealthy.” Methods: We developed a survey including 35 snack food and beverage items and asked respondents to rank from 1-7 how healthy they thought each item was. We assessed healthiness of items using Nu-Val scores, which use nutrient and calorie content to rate foods. We administered the survey to middle school students in a diverse North Carolina County school. Results: 41 adolescents ages 11-12 years responded. Perceived healthiness for most food items was ranked appropriately, particularly fruits and vegetables. Items marketed as healthy ranked higher despite lower Nu-Val scores (e.g. sweetened yogurt, Nutrigrain bars, and Cheerios were ranked healthy by 85%, 66%, and 83% respectively). In contrast, beverage items, specifically those with high sugar content, were ranked healthier than was appropriate. 88% rated orange juice and apple juice as healthy. Adolescents rated both diet soda (87%) and regular soda (78%) unhealthy. In contrast, 27% rated sweet tea as unhealthy. Conclusions: Adolescents have a good understanding of foods that are healthy and unhealthy, particularly for fruits and vegetables. However, they over-rate the value of low-nutrient foods marketed as healthy. Also, they identify soda as unhealthy, regardless of calorie content, and identify other beverages with high sugar content as healthy. Adolescents may need more education about examining calorie content in beverages and accessing marketing claims of healthiness.
T-896-PDT
One-Year Changes in Relative Weight in Urban Youth
Hannah G. Lawman, Giridhar Mallya, Stephanie S. Vander Veur, Tara Alexis McCoy, Lisa Colby, Timothy A. Sanders, Judith Wylie-Roset, Gary D. Foster Philadelphia, PA
Background: Recent cross-sectional data indicate that the rates of childhood obesity are plateauing. Few large-scale longitudinal datasets exist, particularly in low-income and minority youth. Such data allow for a more precise assessment of the factors influencing any change in overall prevalence (e.g., incidence, remission). The purpose of the current study was to describe longitudinal changes in measures of relative weight in a large sample of diverse, low-income youth over a one-year period. Methods: Participants were students from 56 K-8 schools in urban, low-income environments. Measured height and weight were collected in n=17,727 first through sixth graders at baseline and 16,050 first through seventh graders at follow-up (approximately 65% African American and 52% male). Within those samples, longitudinal data were available for n=13,305 youth. Results: Among the cross-sectional samples, the prevalence of overweight (39.9 to 39.3%) and obesity (22.7 to 22.2%) was stable from baseline to follow-up. Among the longitudinal sample, 86.2% of youth remained in the same weight category as baseline, 6.6% improved weight category (remission) and 7.2% worsened weight category (incidence). Longitudinal data showed that over the course of one-year, youths’ BMI percentile (95% CI: -1.61 to -0.20) and BMI z-score (95% CI: -0.05 to -0.03) were significantly lower compared to baseline. At baseline, females and Hispanics had a significantly higher prevalence of obesity, and longitudinally, Asians gained significantly less weight compared to other racial groups. Conclusions: These data indicate that the relative weight status of youth in an urban city is showing signs of small but significant improvement over a one-year follow-up period. However, the rates of childhood obesity remain remarkably high.

T-897-P
Medicaid and Bariatric Surgery: Differing Demographics with Comparable Weight Losses
Sharon Hayes Philadelphia, PA; Melissa Napolitano Washington, DC; Michelle R. Lent Philadelphia, PA; G. Craig Wood, Glenn S. Gerhard, Brian Irving, George Aggroyopoulos Danville, PA; Gary D. Foster Philadelphia, PA; Christopher Still Danville, PA
Background: Relatively little is known about how Medicaid bariatric patient outcomes compare with other insurance groups. Additional information about Medicaid bariatric patients is important to help physicians, insurers, and patients make informed decisions regarding surgery. Methods: Data were examined from 2,553 consecutive gastric bypass patients (M age=45.9 ± 11.2, 80.5% female; 97.1% Caucasian). The majority of patients were privately insured (62.9%; 21.0% Medicare; 16.1% Medicaid). Time from consultation to surgery, pre-surgical weight loss, length of hospital stay (LOS), and percent of excess weight loss nadir were compared between three insurance groups. Results: Medicaid patients were the youngest and most diverse with regard to sex and race. Time to surgery was significantly longer for Medicaid (M days=368.7 ± 220.1) and Medicare (M days=344.3 ± 213.8) patients compared with privately insured patients (M days=320.0 ± 176.3), F(2, 2552)=11.7, p<0.001. Medicare patients’ length of post-surgical stay (M days=3.2 ± 4.6) was significantly longer than privately insured patients (M days=2.44 ± 3.1), F(2, 2549)=10.2, p<0.001, no differences were observed between Medicaid patients and the other groups. No between group differences were observed for pre-surgical weight loss and percent of excess weight loss nadir. Conclusions: Medicaid patients, although demographically different from their privately insured and Medicare counterparts, experience comparable pre- and post-surgical weight losses. Surgeons, physicians, and policy makers alike should consider the significant benefits of bariatric surgery for Medicaid patients when making policy decisions.

T-898-PDT
Obesity Is Under Estimated by Health Care Providers in Younger Women: Racial-Ethnic Disparities in the Diagnosis of Obesity
Melanie Mott, Nicole R. Kitos, Juliana S. Simonetti, Nicole Glazer, Andrea D. Coviciello Boston, MA
Background: Health care providers commonly under diagnose obesity. While there are racial-ethnic disparities in obesity prevalence, it is not clear if there are similar disparities in the diagnosis of obesity. Our objectives are 1) To determine if there are differences in obesity rates in women when obesity is defined by provider assigned ICD9 code compared to objective determination by recorded body mass index (BMI); 2) To determine if there are racial-ethnic differences these obesity rates. Methods: Premenopausal women age 18 to 50 seen at Boston Medical Center in 2011 with PCOS (due to their disproportionately high obesity rates) were identified through a clinical research database (n=22,037). Race-ethnicity was self-reported and classified as follow: Black, Hispanic, white, Asian/Pacific Islander, Native American or Other. Obesity was determined by ICD9 code and by BMI (≥8 kg/m2) in the subset with a recorded BMI (n=19,731, 90%). Comparisons were by Chi2, alpha<0.05, SASv9.2. Results: Mean (± SD) age 37 ± 11 years, BMI 31 ± 8 kg/m2. The overall prevalence of obesity by ICD9 code was 26% (n=5234) compared to 46% by BMI (n=9006). Obesity rates varied by race-ethnicity (p<0.0001, for both ICD9 and BMI) and were under estimated by ICD9 code compared to BMI measure across all race-ethnicities (ICD9 vs BMI): Black 31 vs 52%, Hispanic 33 vs 53%, White 18 vs 33%, Asian 3 vs 10%, Native American 20% vs 37%, Other 22% vs 43% (p<0.0001, for all). Conclusions: Obesity rates were 1) under estimated by 20% in premenopausal women, and 2) under coded in all race-ethnic groups. Black and Hispanic women had the highest obesity rates (52%) and the highest rates of undiagnosed obesity by ICD9 code. This suggests that health care providers are not adequately addressing obesity as a serious health problem in younger women, particularly black and Hispanic women.

T-899-P
How Do Field Measures of Adiposity Compare among Preschool-Aged Children?
Stephanie Mazzucca, Derek Hales, Amber Vaughn, Dianne S. Ward Chapel Hill, NC
Background: Childhood obesity studies often use BMI, waist circumference (WC), or skinfold thickness to approximate adiposity. It is important to consider differences in these measures, especially across age, sex, and race, when studying body composition in young children. Methods: Families (n=253) with at least one child 2-5 y were recruited for a larger intervention study. Child height, weight, WC, triceps and subscapular skinfolds (TSF and SSF respectively) were measured by trained staff, and BMI was calculated. NHANES reference data were used to determine cutoffs for the 85th percentile for each measure. Children were categorized into two groups: <85th and a 85th percentile. Then, percent agreement was calculated for each pair of measures by cross-tabulation across age, sex, and race. Results: Agreement between each pair of measures ranged from 68% to 93%. Comparisons with TSF had the lowest agreement (73-76% vs. 80-86% for all other pairs). Higher agreement was observed among measures of African-American children compared to other races – 85% vs. 68% for BMI-TSF agreement and 93% vs. 84% for WC-SSF agreement. Also, agreement between measures was higher for males compared to females – 77% agreement between TSF-SSF and TSF-WC for males compared to 71% for females. There were some inconsistencies in agreement across age groups. BMI-WC was higher for 3 and 4 year olds (87% and 85%, respectively) vs. 2 year olds (74%), but other pairs had similar agreement between ages. Conclusions: Theoretical and logistic differences in BMI, WC, and skinfolds contribute to the disagreement between these measures. Anthropometric measures should be chosen knowing that each may identify different children as overweight based on child age, sex, and race. Future studies are needed to aid in selecting appropriate field adiposity measures or combinations of measures for young children.

T-900-P
Moving HyOb Research Forward: The International Registry for Hypothalamic Obesity Disorders (IRHOD)
Lindsey S. Shaw, Tawny Wilson Boyce, Rosemary Miller, Todd M. Jenkins, Nathan Bingham, Susan R. Rose, Thomas Inge Cincinnati, OH
Background: Hypothalamic obesity (HyOb) disorders are rare, heterogeneous, and biologically complex conditions with adverse health effects. More research is needed to understand weight gain, behavioral aspects, and treatment effects. Access to cohorts of sufficient size to facilitate such research is difficult. The International Registry for Hypothalamic Obesity Disorders (IRHOD) was created as a case-finding resource for researchers seeking to study HyOb. Methods: A publicly available website, www.irhod.org, was created to provide information about HyOb and function as a registry entry.
portal. Registrants provide medical history and other case details and indicate interest in future research. **Results:** By May 2013, a total of 22 participants had registered. Registrants were primarily female (80%), Caucasian (93.3%), and Non-Hispanic (100%) from 4 countries. Median age was 26.2 years (range: 4.0-54.5), median weight 88.0 kg (range: 15.0-209.0), and median BMI 34.1 kg/m² (range: 13.8-66.0). The most common self-reported diagnosis was cardiophagonygroma (66.7%), and five registrants reported multiple contributing diagnoses. Twenty-five providers/researchers from 6 countries and 21 different institutions also registered as HyOb professionals. The professional make-up of this group is medical (13), neurological (1), surgical (5), and other (6). **Conclusions:** This innovative, web-based approach to registration of potential research participants with a relatively rare condition has potential to improve the quantity of future HyOb research, exploring various aspects of this complex and debilitating form of obesity. Investigators whose research could benefit from this resource are encouraged to register and inquire about mechanisms for cohort access.

**T-901-P**

**The Relationship of A Body Shape Index and Body Mass Index with Health-Related Quality of Life among African Americans: A Study from Fit Body and Soul**

Jane T. Garvin, Lovoria Williams, Thomas V. Joshua Augusta, GA

**Background:** Obesity, typically measured by body mass index (BMI), has variable association with health-related quality of life (HRQoL) in African Americans. This study aims to: A) assess the relationship of obesity defined by BMI and waist circumference to HRQoL in African Americans; B) compare that relationship with BMI and HRQoL in the same sample. **Methods:** Baseline data were collected on participants in the Fit Body and Soul study, a single-blinded, cluster randomized, community trial to test the effectiveness of the faith-based adaptation of Group Lifestyle Balance with non-diabetics. SF-12 and EQ-5D were completed by 601 participants having data available to calculate ABSI. Hierarchical multivariate regression analyses were used to assess associations between obesity, ABSI, and BMI, and HRQoL controlling for socio-demographics. **Results:** Mean age was 46 years (SD 11); 84% were female; 51% were college graduates; 52% were married, and 80% were employed. Mean BMI was 35.7 (SD 7.2); mean waist circumference was 107.7 (SD 15) cm; and the mean ABSI was 0.0774 (SD 0.0047). Neither SF-12, nor EQ-5D significantly added to the variance in ABSI. SF-12 general health, physical summary component, and mental summary components added significantly (6.7%) to the variance in BMI. **Conclusions:** Assessing the relationship between ABSI and HRQoL, we might conclude that there is not an association; however, nesting of employed and educated participants in faith-based communities could be significant. Future studies should examine comparison of those in similar supportive communities with those who are not, as well as examine weight reduction interventions with reductions in ABSI for improvement in HRQoL.

**T-902-P**

**Effects of Depression and Insulin Resistance on Self-Efficacy for Weight Loss Intervention among Obese African American Adolescents**

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**Background:** Adolescent self-efficacy is an important predictor of weight loss. However, adolescents with insulin resistance (IR) may perceive themselves as having less control with regard to their weight. Depression has also been found to be related to treatment outcomes in adults and may have its effects through reducing self-efficacy for weight loss. This study used baseline data from a clinical trial providing weight loss interventions to obese African American (AA) adolescents. It was hypothesized that depression and IR would have main effects on self-efficacy for weight loss; depression was also expected to moderate the effects of IR on self-efficacy. **Methods:** Participants were 113 obese AA adolescents (BMI>95th percentile). Self-efficacy for weight loss was measured by the Confidence Ruler. Depression was measured using the youth PROMIS scale. IR was assessed using HOMA-IR. A multiple regression was conducted, with self-efficacy as the independent variable, and depression, IR, and the depression x HOMA interaction term as dependent variables. **Results:** Depression (β=-0.19, P=0.049) and the depression x HOMA interaction (β=0.25, P=0.016) were significant predictors of self-efficacy (R²=0.27, P=0.046). Moderating effects of depression were further explored in bivariate correlations between HOMA and self-efficacy at various levels of depression. At high levels of depression, higher IR was related to lower self-efficacy (r=-0.44, P<0.05). At low and moderate levels of depression, these relationships were n.s. or weakly positive. **Conclusions:** Results suggest adolescents with more depression and IR may be vulnerable to beliefs that they cannot effectively engage in weight loss behaviors and may require different behavioral interventions.

**T-904-P**

**Dietotherapic Approaches Comparison in Obese Adolescents: Dietary Intake Recall and Equivalent Caloric Counting**

Mara D. Mendes, Maria E. Melo, Marina B. Pioltine, Clarissa T. Fujiwara, Ariana E. Fernandes, Marco C. Mancini São Paulo, Brazil

**Background:** Our aim was to compare the Z-BMI variation in obese adolescents submitted to two distinct dietotherapeutic approaches: a 3-day dietary intake recall (DIR) and equivalent caloric counting (ECC) and evaluate the correlation between Z-BMI variation with anthropometric and metabolic variables dietary intakes and the influence of self-monitoring. **Methods:** In our work, we included obese adolescents attended in the Childhood Obesity League. Patients followed up for 24 weeks, with regular evaluation by a nutritionist. Participants were randomly sorted in two groups; each group received a different nutritional approach (DIR or ECC). Patients had anthropometric, clinical, laboratorial and dietary intake variables assessed. Statistical analysis were performed using paired t-test, independent samples t-test, Mann Whitney Test and Pearson’s and Spearman’s correlation Test, with statistical significance level set at p<0.05. **Results:** The concluded treatment group was composed by 45 patients (64% girls; 14.3±4.0 years), being 25 patients in the DIR group and 20 patients in the ECC group. Patients presented weight loss and significant improvement in metabolic parameters during treatment. No differences were observed among the DIR and ECC groups regarding to Z-BMI variation (-0.18±0.20 vs. -0.24±0.19, p=0.26, respectively). In addition, no differences were found comparing blood pressure percentiles, HDL-cholesterol, glucose and insulin levels and dietary intake. A positive correlation was found between Z-BMI decrease and self-monitoring index in the ECC (r=0.453, P=0.04). **Conclusions:** The nutritional intervention in obese adolescents lead to weight loss independently of the dietotherapeutic approach. Patients tended to present a greater weight loss proportionally to self-monitoring index.
**T-905-P**

**The Effect of Availability of School Sports Teams on Weight Trajectories from Adolescence to Adulthood in the National Longitudinal Study of Adolescent Health**

Tracy K. Richmond, Carly Milliren, Holly Gooding, S. Bryn Austin

**Background:** Sports participation is associated with increased physical activity and improved weight status. However, little is known about availability of sports teams in schools and its impact on weight gain trajectories as adolescents age into adulthood. **Methods:** We used the multi-level model for change to analyze 44,840 observations from 14,530 students nested in 81 schools from Waves I-IV of the National Longitudinal Study of Adolescent Health, limiting our sample to youth attending public schools with at least 2 waves of data available. The primary outcome was body mass index (BMI; kg/m²), the time variable was age of respondent, the individual-level primary predictor was race/ethnicity, and the primary school-level predictor was the number of school sports teams available as reported by school administrators to the federal Office of Civil Rights via an annual school reporting instrument. Models were adjusted for individual- and school-level household income and parental educational attainment. The intercept for BMI was set at age 20. **Results:** In gender-stratified models, Black females and Hispanic males compared to same gender White peers had higher BMI at age 20 (Black female: gamma0,1=1.78, p<0.001; Hispanic male: gamma0,2=0.34, p<0.001) and higher rate of BMI change (Black female: gamma1,1=0.71, p<0.004; Hispanic male: gamma0,2=0.049, p<0.071). Female students attending schools with a higher number of sports teams had a lower BMI at age 20 (female: gamma06=0.025, p<0.001) and a lower rate of weight gain from adolescence to adulthood (female: gamma16=0.0010, p=0.036) compared to their female peers attending schools with lower number of sports teams; there was no effect in males. **Conclusions:** The number of sports teams available in schools appears to decrease weight gain trajectories and may minimize racial/ethnic differences in BMI among females.

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**T-906-P**

**Health Expenditures in Overweight and Obese Children and Adolescents: A National Study Exploring Socio-Demographic Disparities**

Gayatri Patel, Patrick Romano, Peter Franks

**Background:** The healthcare expenditure burden of childhood obesity is uncertain. We examined, in children and adolescents, (1) the associations between healthcare expenditures and being overweight or obese, (2) how these associations vary by socio-demographics (age-group, race/ethnicity, income, insurance status, and region), and (3) secular changes in these associations. **Methods:** We analyzed healthcare expenditure and socio-demographic data on children (aged 6-12) and adolescents (aged 13 to 20) in the 2000-2010 Medical Expenditures Panel Surveys (N=37,920). **Results:** Overall, obese children and adolescents had 19.1% (95% confidence interval [CI] = 3.2%, 37.5%) higher healthcare expenditures than normal weight individuals. The difference was limited to adolescents - overweight and obese individuals had higher total healthcare expenditures, respectively 17.8% (95% CI = 1.1%, 37.3%) and 35.3% (95% CI = 12.9%, 62.0%), than normal weight adolescents. In further stratified analyses: insured obese (compared with normal weight) children and adolescents had 22.8% (95% CI = 5.9%, 42.5%) higher expenditures, whereas uninsured obese (compared with normal weight) children and adolescents had 43.3% (95% CI = 27.4%, 55.6%) lower expenditures; and, minority (compared with white) overweight adolescents had 35.0% (95% CI = 16.6%, 47.5%) lower expenditures. There were no other significant socio-demographic associations or secular trends. **Conclusions:** Overweight and obesity in adolescents was associated with higher expenditures. Stratified analyses identified healthcare expenditure disparities affecting the uninsured overweight and obese as well as overweight adolescent minorities.

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**T-907-P**

**Why Patients Seek Bariatric Surgery: Does Insurance Coverage Matter?**

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**Background:** Despite increasing prevalence of bariatric surgery, little is known about why patients undergo this treatment option. Heads Up is an observational study sponsored by a large insurance organization that examines surgical and nonsurgical approaches to weight management in severely obese adults. Winners of a lottery who met study criteria chose either bariatric surgery (approved by a medical panel) or intensive medical obesity management paid for by their insurance company. This present study examined patients’ reason for choosing surgery, specifically to determine if insurance coverage was a deciding factor. **Methods:** The patient sample was 142 adult obese patients seeking bariatric surgery: Caucasian (63%), African American (35%), female (90%). The mean age was 44.4 years (SD=9.95) and mean BMI was 48.0 kg/m² (SD=5.56). Patients ranked their top three reasons of (8 options presented) for choosing surgery. **Results:** The top three reasons were concerns regarding deteriorating health and shortened life span (54%), current obesity-related medical conditions (31%), and improved physical fitness (30%). Overall, 15% endorsed insurance coverage as one of their top three choices. There was no difference in ratings between men and women or between African Americans and Caucasians. **Conclusions:** Although insurance coverage was a top reason endorsed by few, health concerns were the major reasons reported for obese adults undergoing bariatric surgery. Findings should be tempered by the fact that participants have been obese for several years, yet surgery was sought when offered as a benefit by the insurance program.

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**T-909-P**

**Obesity Epidemic Has Fully Emerged among Urban Nigerians**

Sally N. Akarolo-Anthony, Walter C. Willett, Donna Spiegelman

**Background:** Data from the WHO shows that the prevalence of overweight and obesity increased by ~20% between 2002 and 2010 in Nigeria. We con-
dected this study to examine the determinants of this fast growing epidemic.

Methods: We conducted a cross-sectional study among a random sample of 1058 adults at a government worksite, in Abuja, an urban city in Nigeria. The study participants had varying socio-economic status and a wide range of occupations, including skilled labor and professionals. Log-binomial regression models were used to estimate the multivariable-adjusted associations of potential determinants with the prevalence of overweight and obesity. Results: The mean age and body-mass index of the study population were 42 years ± (9.3) and 27 kg/m² ± (4.8). The overall prevalence of overweight or obesity (body-mass index ≥ 25 kg/m²) was 64% (74% for women and 56% for men). For women compared to men, the prevalence ratio (PR) and (95% confidence interval, CI) was 1.24 (95% CI 1.08, 1.43, p<0.004) for overweight, and 2.54 (95% CI 2.08, 3.10, p<0.0001) for obesity. The peak age of overweight [1.45(95% CI 1.07, 1.97)] for trend=0.002] or obesity [3.07(95% CI 3.01, 21.66), p for trend=0.001] was 40 – 49 years. Compared to individuals in the lower socio-economic status, the PR for obesity among those in the middle and high socio-economic statuses, were 1.39 (95% CI 1.13, 1.72) and 1.24 (95% CI 0.97, 1.59) respectively, p for trend=0.003. Conclusions: About two-thirds of urban, Nigerian adults in this sample were either overweight or obese. The prevalence of overweight and obesity among this population of adult Nigerians, was as high or higher, as it is in the United Kingdom. Female gender and older age were independent predictors of overweight and obesity; while middle or high socio-economic status were independently associated with obesity.

T-910-POT

Occupational Activity and Obesity among Recently Immigrated Mothers in Greater Boston
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Background: Duration in the US has been associated with increased BMI and with declines in occupational activity (OA) among immigrant populations. The relationship between OA and obesity among new immigrant remains unexplored. Methods: Cross-sectional data was derived from Live Well, a community-based participatory-research intervention to prevent weight gain among recent immigrant mothers (<10 years in the US). At baseline, 385 participants reported socio-demographics, lifestyle changes, and changes in diet and PA. A sensitivity analysis among those who participated part-time/full-time was conducted to confirm that OA, rather than employment, drove the association with BMI. Results: Overall, 37% were obese. Occupations in the highest OA tertile include housecleaners and nursing assistants. Unadjusted models showed a 46% lower likelihood of obesity (95% CI: 0.42-1.15) for women in the highest OA tertile vs. the lowest. After adjustment, women in the middle OA tertile were 50% less likely to be obese (95% CI: 0.28-0.92) and women in the highest OA tertile were 54% less likely (95% CI: 0.25-0.85) to be obese, compared to the lowest tertile. The sensitivity analyses confirmed a significant inverse, stepwise, relationship between OA and BMI. Conclusions: OA may protect against obesity among new immigrant mothers. When switching to less physically demanding jobs, women may need to reduce their caloric intake or increase their leisure-time physical activity expenditure in order to avoid weight gain.

T-911-P

Stress, Diet, and Lifestyle in College Students: Analysis of the YEAH Study
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Background: Stress may negatively impact health behaviors that form in young adulthood and have weight and health implications through life. Relationships between stress and behavior are complicated by differences in perceived stress by sex and stress management skills. Methods: The Young Adults Eating and Active for Health (YEAH) study was conducted to test a web-based health intervention on college students. A subsample of baseline participant data was analyzed to explore associations among tertiles of Cohen Perceived Stress Scale, measured BMI, waist circumference (WC), and related health behaviors. Results: The sample (N=1116) was primarily female (70%) and white (75.1%) age 18-19 (9.2%) with mean BMI of 24.0±4.3 kg/m². Stress-by-sex analyses of variance revealed that students in the highest perceived stress tertile had greater BMI (0.8kg/m² males; 1.1kg/m² females) and WC (2.6cm males; 3.5cm females) than those in the lowest tertile. Students who reported practicing effective stress management had lower BMI (1.9kg/m² males; 1.6kg/m² females) and WC (5.2cm males; 3.1cm females) and were 54% less likely (95% CI: 0.28-0.92) and women in the highest OA tertile were 54% less likely (95% CI: 0.25-0.85) to be obese, compared to the lowest tertile. The sensitivity analyses confirmed a significant inverse, stepwise, relationship between OA and BMI. Conclusions: OA may protect against obesity among new immigrant mothers. When switching to less physically demanding jobs, women may need to reduce their caloric intake or increase their leisure-time physical activity expenditure in order to avoid weight gain.

T-912-P

Association between Prenatal Participation in WIC and Rapid Infant Weight Gain Is Mediated by Breastfeeding Duration and by Birth Weight for Gestational Age
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Background: Rapid infant weight gain is an established risk factor for childhood obesity. The objective of this study was to assess the relationship between mothers’ prenatal enrollment in WIC and infant weight gain from birth through 12 months of age. Methods: This prospective cohort study included WIC enrolled infants born during 2008 – 2009 in New York State (n=155,601). Infants were linked to maternal WIC participation records. Outcomes were compared for infants of mothers who enrolled in WIC prenatally (early enrollees) to the infants of women who delayed enrollment until the postpartum period (late enrollees). Multiple logistic regressions assessed the association of early enrollment with rapid infant weight gain defined as a 12 month change in weight-for-age z-score > 0.67. Results: Logistic regression analysis, adjusted for infant and maternal demographics, showed a reduced odds of rapid weight gain (OR: 0.83; 95% CI: 0.82, 0.87) among infants of early vs. late maternal enrollees. The addition of birth weight-for-gestational age and breastfeeding for at least 6 months to the model provided evidence of nearly complete mediation suggesting that early WIC enrollment has a positive effect on both birth weight-for-gestational age and breast feeding for 6 months which were associated with a reduced risk of rapid infant weight gain. Conclusions: These findings suggest that by improving birth outcomes, establishing an effect of prenatal WIC participation, and improving breastfeeding behaviors, the benefits of prenatal WIC enrollment may extend to protecting infants from experiencing rapid weight gain during the first year of life.

T-913-P

Aim for Fitness: Baseline Results from an Urban Public School District’s Physical Education Program Grant
Susan B. Racette, Mary L. Uhrich, Monica A. Metzger, Margaret L. White, B. R. Clark St. Louis, MO

Background: Physical Education Program (PEP) grants are awarded each year by the U.S. Department of Education to enhance PE curricula, nutrition policies, and the health of students nationwide. AIM for Fitness is a 3-year PEP project conducted in collaboration with a large urban public school district. The goals of this project are to implement a comprehensive, enhanced physical education curriculum throughout the district’s 46 elementary schools and to evaluate its impact on student health, fitness, and lifestyle behaviors. Methods: Year 1 participants included 1045 students (50.4% girls, 83.7% black, 95.1% free/reduced lunch status, age 10.1 ± 0.8 y [mean±SD]) in grades 4 and 5 attending 15 schools. Outcome measures are body composition using the TANITA IronKids BF-2000, BMI from measured weights and heights, cardiorespiratory fitness from the 20-meter PACER test, daily pedometer step counts for 3 weeks, and fruit/vegetable intake on 3 occasions using the SPAN questionnaire. Results: Body fat averaged 26.9 ± 9.7% in girls and 21.0 ± 9.1% in boys; the prevalence of “overfat” or “obese” categorization was 40.4% in girls and 31.4% in boys. Based on BMI-for-age percentiles, 43.3% of girls and 34.8% of boys were categorized as overweight or obese. Among an age-eligible subsample for the PACER test, 56.3% of stu-
dents did not achieve Healthy Fitness Zone® standards. Daily step counts were 7174 ± 2611 among students with an average of 4 days of plausible pedometer data. Fruit and vegetable intake averaged 2.0 and 3.2 servings/day, respectively.

**Conclusions:** The relative high prevalence of excess adiposity, overweight/obesity, low cardiorespiratory fitness, and low physical activity observed in these urban public schools highlight the importance of curricular enhancements and novel approaches for promoting physical activity during the school day as well as before and after school.

T-916-P

**Preschool Children Influence on Maternal Purchasing Decisions of Sugar-Sweetened Beverages (SSB) and Fruit Juice (FJ)**

Melissa Guzman, Michael Anderson Oklahoma City, OK; Jack J. Kasulis Norman, OK; Karina Lora Oklahoma City, OK

**Background:** Children are recognized to influence parental purchasing decisions. This study explores to what degree preschool children’s influence on maternal purchasing decisions of SSB and FJ and maternal characteristics associated with yielding to the child. **Methods:** Low-income mothers (N=66) of preschool children participating in a study assessing family psychosocial correlates of SSB and FJ purchasing behaviors. Mothers reported whether they take their child grocery shopping, whether the child helps select SSB (soja, juice drinks, and sports drinks) and FJ, and whether the child influences SSB and FJ purchases. Responses ranged from “always” to “never” on a Likert scale. Separate SSB and FJ questions allowed the creation of two composite scores for children’s influence on maternal purchasing of SSB and FJ. Iteratively reweighted least squares regression analysis was used to test the independent effect of demographic covariates on the composite scores.

**Results:** Sixty-four percent of mothers “always” or “almost always” brought their child grocery shopping; 41% and 30% of mothers “sometimes” let the child help select what SSB and FJ to buy, respectively. Children influenced 26% of SSB purchases “sometimes” and 67% influenced FJ purchases “always” or “almost always”. In the regression models, only maternal education was inversely associated with SSB (mother lets child help select and influence SSB purchases) and FJ (mother lets child help select and influence FJ purchases) composite scores (p<0.001). **Conclusions:** At an early age children accompany mothers while grocery shopping and are able to influence maternal purchasing behaviors of SSB and FJ. Although mothers yielded to the child’s influence to purchase FJ more frequently than SSB, children’s influence on maternal purchases of SSB and FJ was associated with maternal education.

T-917-P

**Purchasing Behaviors of Sugar-Sweetened Beverages (SSB) and Fruit Juice (FJ) of Low-Income Fathers of Preschool Children**

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**Background:** Although mothers are seen as the main shoppers, availability of SSB and FJ in the home purchased by fathers/partners is important to explore to characterize sources, composition and amount of beverages that can potentially affect consumption. The study examined the purchasing behavior of fathers/partners living in the home of preschool children in relation to the purchase of SSB (soda, juice drinks, and sports drinks), diet soda, and FJ. **Methods:** Low-income multicultural mothers (N=118) of preschool children participated in a study that assessed family psychosocial correlates of availability of SSB and FJ in the home. Mothers provided demographics and information on type of beverages purchased for the household by preschool children’s fathers/partners. Responses were tabulated for each survey item, and chi-square tests were used to determine whether the distribution of responses were the same across categories. **Results:** Fifty five percent of mothers were enrolled in SNAP; Sixty five percent of mothers were married/partnered but 58% reported two adults living at home. Fathers/partners were the second main purchaser of beverages for the home (46%) after the mother. Among beverages purchased by fathers/partners, 85% and 11% were SSB and FJ, respectively (p<0.001). Few parents purchased diet soda (4%). Among SSB types, fathers/partners purchased significantly more soda and sports drinks than juice drinks and diet soda (p<0.001). **Conclusions:** Fathers/partners seem to be a considerable source of SSB availability. Information is lacking on the relationship of male figures and the availability of high-caloric foods. Targeted approaches to addressing family obeseigenic behaviors should address fathers’ role modeling and their contribution to availability of foods at home that can influence young children’s dietary behaviors.

T-915-P

**Social Environmental Predictors of BMI, Waist Circumference and BMI-Waist Circumference Composite in Underserved African-American Adults**

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**Background:** African Americans have the highest rates of obesity in the United States relative to other ethnic minorities. Ecological factors including social and environmental factors play an important role in understanding obesity, especially in underserved populations. The purpose of this study was to examine social and environmental factors that predict weight-related outcomes, including waist circumference (WC), Body Mass Index (BMI), as well as a BMI-WC composite (BWCC). **Methods:** This study used baseline PATH randomized trial data, which collected biocological data from 434 African Americans who lived in one of three low-income communities matched based upon US census information. Participants provided demographic, anthropometric, and 7-day accelerometer-assessed moderate-to-vigorous MVPA data, and completed psychosocial questionnaires. In separate multiple regressions models, each of the three weight-related outcomes (WC, BMI, BWCC) were regressed on covariates (age, sex, MVPa) and five psychosocial variables representing places for walking and cycling, neighborhood satisfaction, neighborhood social life, social support from friends, and self-efficacy. **Results:** Overall multiple regression models predicting BMI, WC, and BWCC were significant, with significant associations of each outcome variable with average daily MVPa (B =-0.08, p=0.04, -0.13, p<0.05, respectively) and neighborhood social life (B =-0.37, -0.15, -0.52, p<0.05, respectively). **Conclusions:** These results show that as neighborhood social life increase, weight related outcomes decrease. Findings in the present study are consistent with a growing literature, which shows that social environment is critically linked to weight related outcomes. Future prevention and interventional efforts should continue investigating social life factors, particularly longitudinally.
**T-918-P**

**Continued Emphasis on Dietary Quality Is Important for Obese Minority Youth Following a Diet Plan**

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**Background:** Minority youth remain in need of effective strategies to engage in weight loss behaviors such as healthy eating. Supporting autonomy during weight loss, particularly during adolescence, may help. **Methods:** We examined how the youth’s choice of diet plans, either a total calorie goal (TCG, tracking all kcals) or a 500 calorie deficit (CD, cutting 500 kcals), affected the intake of obese African American adolescents (oAAA) participating in a 6-month sequential multiple assignment randomized trial (SMART) for weight loss. The Block food frequency questionnaire was completed at baseline, 6, and 9 months with 52% choosing the TCG and 48% choosing the CD plan. **Results:** The AAO sample (BMI=38.27±7.52, age=13.80±1.30 yrs, 65% female) was 65 and 57 for 6M and 9M respectively after excluding reported intakes of <500 kcals or >3500 kcals. No differences were found in total kcals consumed and percentage of kcals from macronutrients (p<0.05) between the two diet plans. At 6M regardless of diet plan oAAA reported a significant decrease in total kcals (1383±623 to 1067±483; p<0.001) with decreases in grams of fat, fiber and protein (p<0.01), servings of grain, meat and dairy (p<0.05), and sodium and cholesterol (p<0.01). At 9M these significant findings were maintained with the exception of servings of diary (p=0.099), and was not significantly correlated with body fat percentage (r=0.127, p=.034), height estimation error (r=-1.55, p=.009); BMI (r=-0.258, p<.001), hip measurement (r=0.265, p<.001), and waist measurement (r=0.325, p<.001), and was not significantly correlated with body fat percentage (r=-0.099, p=.099). Height estimation error shared a significant correlation with body fat percentage (r=-0.123, p=.040) and weight estimation error. **Conclusions:** These results indicate higher BMI scores, hip and waist measurements may be related to poor nutritional estimations beyond energy intake.

**T-919-P**

**The Relationship Between Body Mass Index (BMI), Body Fat Percentage, Waist and Hip Measurements and Weight and Height Estimation Errors**

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**Background:** People underreport their body weight, and this self-reporting bias is more prevalent in people who are overweight or obese (e.g., Vil-lanueva, 2001). Most studies with this finding were retrospective data reviews and previous studies did not include waist and hip measurements in the analysis. The purpose of this study was to replicate this finding in a prospective sample and examine if a person’s gender, BMI, body fat percentage, hip, and waist measurements would predict weight and height estimation errors. It was hypothesized that greater BMI, body fat percentage, hip, and waist measurements would lead to greater estimation error. **Methods:** Two hundred eighty participants were recruited for a study on eating behavior. For this study, they were asked to report their weight and height via an online questionnaire. Participants came into the lab and had weight, height, BMI, body fat percentage, hip, and waist measurements recorded. Estimation error was calculated with the absolute value of the difference between reported and measured weight and height, respectively. Pearson’s correlations were calculated between weight and height estimation error and all variables. Gender was coded using 0 for males and 1 for females. **Results:** Weight estimation error shared a significant moderate correlation with gender (r = .127, p = .034), height estimation error (r = -.155, p = .009); BMI (r = -.258, p < .001), hip measurement (r = -.265, p < .001), and waist measurement (r = -.325, p < .001), and was not significantly correlated with body fat percentage (r = -.099, p = .099). Height estimation error shared a significant correlation with body fat percentage (r = -.123, p = .040) and weight estimation error. **Conclusions:** These results indicate higher BMI scores, hip, and waist measurements may be related to poor nutritional estimations beyond energy intake.

**T-920-P**

**Anthropometric Variables and Fat Mass As Predictors of Cardiometabolic Risk Factors**

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**Background:** Cardiovascular disease is a leading cause of death and disability at adult age. Overweight and obese children/adolescents are an especially at-risk population. Our aim was to evaluate the association between anthropometric and body composition parameters and cardiometabolic risk factors (CM-RF). **Methods:** Overweight and obese children/adolescents with complete evaluation for CM-RF – blood pressure, fasting glucose and lipids – were included. Cut-off points were set according to the recommendations of the 2011 Integrated Pediatric Guidelines for Cardiovascular Risk Reduction (Pediatrics, 2011). BMI z-score, waist/height ratio (w/h) and fat mass percentage (In Body®) were collected. Statistical analysis was performed using t-test and binary logistic regression. Statistical significance was set at 0.05. **Results:** 88 patients were included (53 female; 91% obese) with mean age 10.8 years (SD 2.9). Mean BMI z-score was 2.6 (SD 1.0), mean ratio w/h 0.6 (SD 0.1) and mean fat mass percentage 40.4 (SD 7.1). BMI z-score was significantly different in the group with CM-RF (2.3 ± 0.7 vs 2.9 ± 1.2, p = 0.0005). Values for w/h ratio and fat mass (%) were 0.6 ± 0.1 vs 0.6 ± 0.2 (p = 0.613) and 38.8 ± 7.3 vs 41.4 ± 6.8 (p = 0.131) for the group without and with CM-RF, respectively. Only BMI z-score was a significant predictor of the presence of CM-RF (p<0.046) in multivariate analysis. **Conclusions:** In our population of overweight and obese patients, BMI z-score was a predictor of the presence of CM-RF. A non-significant trend towards higher fat mass percentage in the group with risk factors was also observed. Further studies with larger samples are required.
achieve a weight loss ≥2% initially. Similarly, participants losing <3% at Month 2 were 5.6 (95% CI: 3.4, 9.2) times more likely to have a weight loss <10% at Year 1, compared to those losing ≥2% initially. Of those achieving a ≥10% weight loss at Year 1, only 13% had a weight loss ≥2% at Month 1 and 6% had a weight loss <3% at Month 2. Conclusions: Individuals failing to achieve a ≥2% or ≥3% weight loss at Months 1 and 2 respectively, rarely go on to attain a ≥10% weight loss at 1 year. Thus, future studies should examine whether these early non-responders can be ‘rescued’ through the provision of additional support or alternative treatment approaches and whether this early identification and intervention improves overall treatment outcomes.

T-3-OR
Caloric Information Reduces Sugary Beverage Consumption: Evidence from a Corner Store Intervention
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Background: One promising strategy to reduce consumption of sugar-sweetened beverages (SSBs) may be to provide more easily interpretable caloric information. Methods: The study used a case-crossover design with six corner stores located in low-income, predominately black neighborhoods in Baltimore City. The intervention randomly posted one of four signs with caloric information: absolute caloric count, number of teaspoons of sugar, number of minutes of jogging, number of miles of walking. Data for 3,000 beverage sales by black adolescents, ages 12 to 18, were collected, including 600 during a baseline period and 600 for each type of caloric information. Results: Providing any caloric information (relative to baseline) significantly reduced the number of total beverage calories purchased, the likelihood of buying an SSB, and the likelihood of buying an SSB greater than 16 ounces (p < 0.05). Providing adolescents with caloric information as miles of walking necessary to burn off a bottle of soda or fruit juice, as compared to absolute calories, significantly reduced the number of calories purchased (all purchases: 67 kcal vs. 81 kcal, p = 0.09; all beverage purchases: 172 kcal vs. 188 kcal, p = 0.03; and all SSB purchases: 188 kcal vs. 202 kcal, p = 0.01). Conclusions: Providing adolescents with caloric information – particularly the miles of walking required to burn off a bottle of soda – is associated with three key outcomes: purchasing a smaller sugary beverage, switching from a sugary beverage to one with no calories or no added sugar, or not purchasing a beverage.

T-4-OR
Reduction in Calories Consumed Away from Home Fully Mediates the Relation between Improved Diet Quality and Child Weight Loss in Family-Based Behavioral Treatment
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Background: Family-Based Treatment (FBT) is an effective intervention for childhood obesity. Diet-related treatment targets include improving nutrient quality and reducing calories consumed away from home (typically less healthy); however, the effect of these specific changes on weight loss is unknown. The aims of the present study were to evaluate whether 1) change in diet quality is related to child weight loss (ZBMI) during FBT, and 2) reduction in calories consumed away from home mediates the relation between diet quality and weight loss. Methods: Overweight children (N=173) ages 7-11y, each with at least one overweight parent, completed 4-month FBT. Participants completed 24-hour dietary recalls, including food consumption location, at baseline and post-treatment. Diet quality was evaluated using the Healthy Eating Index-2005. A bootstrapped mediation analysis was used to test the association between change in diet quality and weight loss, and whether change in calories consumed away from home mediated this relation, controlling for child sex, age, and baseline values of weight, calories away from home, and diet quality. Results: Mean diet quality improved over treatment (p<.001). Improved diet quality was associated with greater weight loss (p<.05) and reduced calories consumed away from home (p<.001); and reduced calories away from home was associated with weight loss (p<.01). In the mediation model, the indirect effect of change in calories consumed away from home was significant (p<0.05); and the direct effect of diet quality on weight loss was no longer significant (p>.20). Conclusions: Improved diet quality is associated with child weight loss during FBT, and this effect appears fully mediated by decreasing calories consumed away from home. Encouraging families to improve diet quality by reducing calories away from home is an important treatment target.
T-5-OR
Small Financial Incentives Cost-Effectively Improve Outcomes in a Statewide Internet Obesity Program
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Background: Statewide wellness campaigns have wide reach and therefore provide an excellent platform to disseminate behavioral weight loss interventions. We previously showed that combining Shape Up Rhode Island, a statewide campaign, with an Internet behavioral weight loss program (SI) improves weight outcomes. The purpose of this study was to examine whether adding small financial incentives or optional group sessions further improves a) initial weight loss, b) weight maintenance, and c) intervention cost-effectiveness. Methods: Shape Up 2012 was a 3 month Web program that promoted weight loss and physical activity. Participants (N=268; 83% Female, BMI=33.6±6.3kg/m2) were recruited from the weight loss division and randomized to SI, SI+Incentives, or SI+Group. Incentive participants could earn $10/week (max=$54) for submitting self-monitoring data into the study website; those who achieved a clinically significant weight loss were also entered into a raffle. Group participants were invited to weekly meetings that included weigh-ins. Results: Retention was 94% at post-treatment and 91% at 12-month follow-up. At post-treatment, the enhanced conditions yielded greater weight losses than SI (SI: 4.0±4.9%; SI+Incentives: 6.0±4.9%; SI+Group: 5.6±5.3%; p<.04). Post-treatment cost-effectiveness ratios of SI and SI+Incentives were similar ($21/kg; $22/kg) and superior to SI+Group ($73/kg). At month 12, SI and SI+Incentives had significantly more weight regain than SI+Group (SI: +3.0±5.5%; SI+Incentives: +3.0±4.5%; SI+Group: +1.2±5.7%; p<.03). Despite the weight regain, SI+Incentives was the most cost-effective approach at month 12 ($45/kg; SI+Incentives: $45/kg; SI+Group: $92/kg). Conclusions: Modest financial incentives ($2.66/week + raffle) are a cost-effective method to enhance weight loss in Web-based dissemination initiatives.

T-6-OR
Tackling Childhood Obesity in Underserved Communities: The MEND Program
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Background: MEND (Mind, Exercise, Nutrition… Do it!) is a community-based, multi-component, child weight management intervention widely disseminated in the USA, Canada, UK and Australia (www.mendeffect.org). Here we present US community implementation data. Methods: Seven to 13 year old overweight and obese children participated in 275 MEND programs (fully adapted for US implementation). The family-based program consisted of an intensive 10-week phase, followed by maintenance and support. Sessions included behavior modification, nutrition education and physical activity. The intervention was delivered by a wide range of professionals in community venues. Outcomes were assessed at baseline and 10-weeks. Results: Of the 2495 children (46% boys; mean age 10.2 years; BMI 45% of overweight, and 81% of obese girls desiring to be thinner (p < .0001). In multiple variable regression analysis, weight status was significantly related to weight status, with 15% of normal weight, 45% of overweight, and 81% of obese girls desiring to be thinner (p < .0001). Analysis conducted with multiple variable regression models, adjusting for race and Tanner stage. Results: Mean age 12.1 (0.7) years, 90.4% African American, mean weight 48.4% normal BMIz < 85th %ile, 20% overweight BMIz > 85th %ile & 95th %ile, and 31.6% obese BMIz > 95th%ile. Body dissatisfaction was significantly related to weight status, with 15% of normal weight, 45% of overweight, and 81% of obese girls desiring to be thinner (p < .0001). Conclusions: The strong association between weight status and disordered eating (anorexia), partially mediated by body dissatisfaction, together with high rates of obesity, highlight the psychosocial burden of excess weight among young African American girls.

T-7-OR
Obesity and Disordered Eating among African American Early Adolescent Girls
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Background: Obesity and disordered eating are major public health problems among adolescent girls. Unknown whether they are related among low-income, African American early adolescent girls or whether body dissatisfaction mediates a relationship between weight status and disordered eating. Methods: Recruited 789 sixth and seventh grade girls from 22 urban schools serving low-income communities. Weight and height were measured and converted to age and gender adjusted BMI z-scores (BMIZ), disordered eating (anorexia) was measured by the Children’s Eating Attitude Test with coefficient alpha > 0.73, and body dissatisfaction measured by silhouettes. Mean absolute difference in repeat measures was <.1 BMI. Analysis conducted with multiple variable regression models, adjusting for race and Tanner stage. Results: Mean age 12.1 (0.7) years, 90.4% African American, mean weight 48.4% normal BMIZ < 85th%ile, 20% overweight BMIZ > 85th%ile < 95th%ile, and 31.6% obese BMIZ > 95th%ile. Body dissatisfaction was significantly related to weight status, with 15% of normal weight, 45% of overweight, and 81% of obese girls desiring to be thinner (p < .0001). In multiple variable regression analysis, weight status was significantly related to disordered eating (anorexia) (B=2.08, p<.001). Body dissatisfaction was significantly related to weight status (B=1.81, p<.001) and disordered eating (B=2.66, p<.001). The weight status–disordered eating relationship was significantly attenuated (B=1.42, p<.001, Sobel’s test, z=4.30, p<.001) with body dissatisfaction in the model. Conclusions: The strong association between weight status and disordered eating (anorexia), partially mediated by body dissatisfaction, together with high rates of obesity, highlight the psychosocial burden of excess weight among young African American girls.
T-9-OR
Independent of BMI, Female Binge Eaters Are More Likely to Develop Diabetes
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Background: Binge eating involves eating a large amount of food, frequently highly processed foods, in a short amount of time. Thus, requiring a large insulin response and potentially increasing the risk for insulin resistance. However, no studies has evaluated whether young who binge eat are at increased risk of diabetes. Methods: Using prospective data from 9039 adolescent and young adult females in the ongoing Growing Up Today Study, we examined the prospective association between frequent binge eating and risk of developing diabetes. We used information on eating disorder behaviors collected annually in 1996-1999 to predict onset of diabetes between 2000 and 2010. Participants reported physician-diagnosed diabetes in 2010 and their mothers, who are nurses, reported their child’s diabetes history in 2004 and their own history on biennially Nurses’ Health Study II questionnaires. Children reported to have type 1 diabetes were censored from the analysis. Results: Between 2000 and 2010, when the females were 13 to 30 years of age, 42 cases of diabetes were reported. After excluding cases that developed before 2000 or were type 1, there were 34 incident cases for analysis. Between 1996 and 1999, 104 girls engaged in frequent binge eating (> weekly) and 83 girls met criteria for binge eating disorder (BED, binge eating > weekly and no purging). Independent of age, BMI, and maternal history of diabetes, girls who binged frequently were five times more likely than their peers to develop diabetes (odds ratio (OR)=4.8, 95% confidence interval (CI) 1.2-19). The risk was highest for girls meeting criteria for BED (OR=6.3, 95% CI 1.6-24). There was no association between less frequent binge eating and risk of developing diabetes. Conclusions: Independent of their weight status, girls who frequently binge eat are at high risk group for developing diabetes.

T-10-OR
Alcohol Consumption and Food Addiction in Two Cohorts of Middle-Aged and Older Women: A Cross-Sectional Analysis in the Nurses’ Health Study
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Background: Neurobiological similarities between drug or alcohol addiction and food consumption suggest that excess food consumption may be conceptualized as an addictive behavior. We previously reported a strong positive association between self-reported attributes of food addiction and body mass index (BMI). Previous studies have found a U-shaped relationship between alcohol consumption and BMI, but it is unknown whether alcohol consumption is related to indications of food addiction. Methods: This cross-sectional analysis utilized response data from 113,358 participants in the Nurses’ Health Study and Nurses’ Health Study II, ongoing prospective cohort studies of US adult women, who provided responses to questions derived from the Yale Food Addiction Scale (YFAS) in 2008-2010 and 2009-2011, and on average past-year alcohol consumption (grams/day) in 2006-2008 and 2007-2009, respectively. We used a modified YFAS with a diagnostic threshold of ≥3+ addiction symptoms (out of 7) in addition to the presence of significant impairment or distress. Results: After multivariable adjustment, we found a U-shaped relationship between alcohol consumption and food addiction. Compared to non-drinkers, the odds (95% confidence intervals) of food addiction were 0.97 (0.91-1.04) for <5.0 g/day, 0.92 (0.85-0.99) for 5.0-<15.0 g/day, 0.82 (0.73-0.93) for 15.0-<30.0 g/day, 0.68 (0.55, 0.83) for 30.0-<45.0 g/day, and 1.13 (0.87, 1.47) for 45.0+ g/day. Conclusions: The inverse association between light to moderate alcohol consumption and food addiction supports research that food and alcohol compete for access to similar neurotransmitter pathways, so that excess food and alcohol are not consumed simultaneously. Because this is a cross-sectional study, however, we cannot infer a causal relationship, and further research should look prospectively at the onset of symptoms related to food addiction.

T-11-OR
Food Addiction: Its Prevalence and Significant Association with Obesity in the General Population
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Background: ‘Food addiction’ shares a similar neurobiological and behavioral framework with substance addiction. However whether, and to what degree, ‘food addiction’ contributes to obesity in the general population is unknown. The objectives are to assess 1) the prevalence of ‘food addiction’ in the Newfoundland population; 2) if clinical symptom counts of ‘food addiction’ were significantly correlated with the body composition measurements; 3) if food addicts were significantly more obese than controls, and 4) if macronutrient intakes are associated with ‘food addiction’. Methods: A total of 652 adults (415 women, 237 men) recruited from the general population participated in this study. Obesity was evaluated by Body Mass Index (BMI) and Body Fat percentage measured by dual-energy X-ray absorptiometry. ‘Food addiction’ was assessed using the Yale Food Addiction Scale and macronutrient intake was determined from the Willet Food Frequency Questionnaire. Results: The prevalence of ‘food addiction’ was 5.4% (6.7% in females and 3.0% in males) and increased with obesity status. The clinical symptom counts of ‘food addiction’ were positively correlated with all body composition measurements across the entire sample (p<0.001). Obesity measurements were significantly higher in food addicts than controls; Food addicts were 11.7 (kg) heavier, 4.6 BMI units higher, and had 8.2% more body fat and 8.5% more trunk fat. Furthermore, food addicts consumed more calories from fat and protein compared with controls. Conclusions: Our results demonstrated that ‘food addiction’ contributes to severity of obesity and body composition measurements from normal weight to obese individuals in the general population with higher rate in women as compared to men.

T-12-OR
Temperament, Emotion Dysregulation and Loss of Control Eating in Adolescents
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Background: Loss of control (LOC) eating is a robust risk factor for excess weight gain and metabolic dysfunction in youth. Little is known about endophenotypes that increase risk for LOC eating in adolescents. Thus, we investigated the association between LOC eating and two theoretically driven endophenotypes: impulsive/emotional temperament and emotion dysregulation. Methods: Participants were 100 non-treatment seeking adolescents (13-18y; 72% female; 58% non-Hispanic White; BMIz 1.0±0.9). The Eating Disorder Examination determined LOC presence in the past 3 months. The Early Adolescent Temperament Questionnaire assessed parent-reported temperament dimensions and the Difficulties in Emotion Regulation Scale measured self-reported aspects of emotion dysregulation. Results: Adolescents with LOC (27%) described poorer attention and inhibitory control than those without LOC (p<0.01), controlling for sex, race, age, BMIz, and depressive symptoms. Per parental report, adolescents with LOC had a more fearful temperament than did those without LOC (p<0.02), controlling for the same covariates. There were no significant associations between LOC and other affective components of temperament including negative affect, shyness, depressive mood, frustration, or aggression (p>0.05). When youth were queried about their response to stressors, adolescents with LOC reported lower distress tolerance than those without LOC (p<0.03), controlling for the same covariates. Conclusions: Trait impulsivity, high stress reactivity, and low distress tolerance may play important roles in the etiology and/or maintenance of LOC eating in adolescents. Mechanistic studies are needed to investigate whether these endophenotypes differentially lead to excess weight gain via LOC eating in youth to refine theoretical models and identify novel obesity prevention targets.
Long-Term Healthcare Costs of Overweight and Obese Veterans
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Background: In the past 25 years, there have been over 50 studies estimating the association of obesity and health expenditures. Nearly all of them have been cross-sectional samples of survey respondents, which limits our understanding of obesity’s impact on health over the long term. The purpose of this study was to estimate the longitudinal (2002-2011) association between body mass index (BMI) and VA health expenditure trends. Methods: A retrospective cohort study of a random sample of veterans who obtained care in VA in 2002 and had height and weight data from a clinical visit to construct BMI, representing 263,568 veterans with 2,093,268 person-year observations. We estimated logged VA expenditures in 2002-2011 using mixed models with an independent correlation structure, adjusting for age, gender, race, marital status and copay status. Results: Patients in obese class III had the highest VA expenditures of all patients in every year, with excess 10-year costs equal to $18,013 when compared to normal weight patients. VA expenditures were $635 higher for obese class III patients than normal weight patients in 2002, which increased to $3,307 higher expenditures in 2011. Conclusions: This is the first 10-year analysis of health expenditures attributable to obesity, which demonstrates that the cost of obesity burgeoned for veterans in 2002-2011. Leveraging longitudinal data from an integrated electronic health record that captures longitudinal height and weight data on a large cohort of patients enables assessments not possible with cross-sectional data.

Sick Leave Days and Costs Associated with Overweight and Obesity in Germany
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Background: Evidence from the international literature has demonstrated that (overweight and) obesity are positively associated with sick leave (absenteeism). For Germany, no study exclusively concerned with the association between excess-weight and sick leave (costs) has been published to date. The aim of this study therefore was to investigate the impact of Body Mass Index on sick leave days and related costs. Methods: Cross-sectional analysis of pooled data (n = 7,990) from the 2009/2010 waves of the German socio-economic panel (SOEP). The bivariate relationship between BMI and sick leave days was analyzed using ANOVA methods. The multivariate association, controlling for socio-demographic, occupational, and health covariates, was investigated using zero-inflated negative binomial regression models (ZIPB). Results: The bivariate analysis revealed significant differences in the number of mean annual (2009) sick leave days for normal-weight (7.45), overweight (9.77), and obese employees (14.04), p < 0.001. Patients in obese class III had the highest VA expenditures of all patients in every year, with excess 10-year costs equal to $18,013 when compared to normal weight patients. VA expenditures were $635 higher for obese class III patients than normal weight patients in 2002, which increased to $3,307 higher expenditures in 2011. Conclusions: This is the first 10-year analysis of health expenditures attributable to obesity, which demonstrates that the cost of obesity burgeoned for veterans in 2002-2011. Leveraging longitudinal data from an integrated electronic health record that captures longitudinal height and weight data on a large cohort of patients enables assessments not possible with cross-sectional data.

Impact of Socioeconomic Disparities on the Relationship between Physical Fitness and Academic Outcomes among New York City Public School Children in Grades 6-8, 2006-2010
Carla Bebold Boston, MA; James Stark, Sophia E. Day, Cathy A. Nones, Tiffany G. Harris, Kevin Konyt Queens, NY

Background: High poverty students tend to be at an academic disadvantage and efforts are being made to decrease this achievement gap. Physical activity and fitness are important contributors to academic achievement yet it is unknown whether they might perpetuate or ameliorate this gap. This longitudinal study assesses whether fitness-academic relationships vary by student poverty and race/ethnicity. Methods: The analysis included 87,000 students who consecutively completed grades 6-8 in New York City public schools. Unique student identifiers linked annual fitness and academic test results and demographics from 2006-2010. Composite percentiles (CP) grouped by age and sex were created for academics (using English and math scores) and fitness (using 3 fitness tests); changes were measured by differences in consecutive years’ CP scores. A substantial change in fitness was considered ±20 percentage points. Changes by poverty (high=full price lunch vs. low=full price lunch) and race/ethnicity were examined separately by sex using multilevel individual growth models. The annual rates of change in academic CP scores are reported (significant at p<0.05). Results: A substantial increase in fitness was associated with an increase in academics only in high poverty boys (0.6) and girls (0.5). A substantial decrease in fitness was associated with decreases in academics in both high poverty and low poverty boys [-0.9, -0.6] but only in high poverty girls [-0.6]. Conclusions: Improvement in fitness increased student academic achievement and decreased academic gaps. Strategies should be considered to improve fitness as part of approaches to improve academic performance. Removing fitness opportunities may further increase disparities by having a more detrimental effect on academic achievement in higher poverty students.

American Adults in the Supplemental Nutrition Assistance Program Consume More Sugary Beverages Than Ineligible Adults
Sara N. Bleich Baltimore, MD; Seanna Vine New York, NY; Julia A. Wolfson Baltimore, MD

Background: There is considerable debate about whether sugar-sweetened beverages (SSBs) should be allowable purchases with benefits from the Supplemental Nutrition Assistance Program (SNAP). Methods: Cross-sectional analysis of 24-hour dietary recall data obtained from the National Health and Nutrition Examination Survey 2003-2010 (N=17,208), analyzed in 2013. Results: In 2003-2010, 64% of adults receiving SNAP consumed SSBs, averaging 289 calories daily (14% of the recommended 2000 kcal/day diet), and 68 grams of sugar. Compared to adults ineligible for SNAP, adults receiving SNAP consumed a higher percentage of SSBs (64% vs. 59%, p = 0.01), more calories from SSB per capita (203 kcal vs. 173 kcal, p = 0.007), and more daily calories from SSBs among drinkers (289 kcal vs. 263 kcal, p = 0.037). Overall, per capita consumption from SSBs was highest among adults receiving SNAP (203 kcal, 10% total daily intake), followed by adults eligible but not participating in SNAP (196 kcal, 9% total daily intake) – both of which had significantly higher SSB consumption than ineligible adults (173 kcal, 8% total daily intake) (p < 0.05). Conclusions: Adults eligible for SNAP benefits consume more SSBs than ineligible adults. There is little difference in SSB consumption between adults receiving SNAP and eligible adults not participating in the program, suggesting that low-income adults typically consume high levels of SSBs, regardless of government assistance.

Neighborhood SES and Food Environment: A 20 Year Longitudinal Latent Class Analysis in Coronary Artery Risk Development in Young Adults (CARDIA) Participants
Andrea S. Richardson, Katie A. Meyer, Anne Green Howard Chapel Hill, NC; Catarina Kiefe Worcester, MA; Lisa C. Lewis Birmingham, AL; Penny Gordon-Larsen Chapel Hill, NC

Background: Whether changes in neighborhood socioeconomic (SES) domains relate to neighborhood food availability is unknown. Such associations may help explain SES-related disparities in obesity. Methods: We used latent
class analysis (LCA) to classify CARDIA participants into longitudinal SES patterns over 20 years of follow-up (1985-86 to 2005-06). We included Census tract-level income/poverty, race, employment, education, and housing value in the LCA. We identified the number of informative classes using Lo-Mendell-Rubin (LMR) p-value (k vs. k – 1 class). The Kruskal-Wallis test compared the number of neighborhood food stores and restaurants (counts/100 km roadway within 3k Euclidean buffer) by neighborhood SES class and year. We calculated LCA-specific changes in mean food stores and restaurants between 1985-86 and 2005-06. Results: We identified four classes of individuals classified by longitudinal neighborhood SES (LMR p=0.005 vs. 0.64 for five classes): downward mobile (n=1045); stable low-SES (n=1663); upward mobile (n=568); and stable high-SES (n=1839). Mean number of neighborhood food stores and restaurants increased over 20 years in all classes, but differed by class (p<0.0001). The mean number of fast food restaurants increased in downward mobile (+1.5), stable low-SES (+1.4) and upward mobile (+0.6) neighborhoods. The mean number of non-fast food restaurants increased in downward mobile (+0.2) and decreased in upward mobile (-5.0) neighborhoods. Class differences in supermarket changes were not appreciable. Conclusions: Compared to the upward mobile, people living in socioeconomically disadvantaged and downward mobile neighborhoods experienced greater increases in the number of neighborhood fast food (and also all) restaurants from the mid 1980’s to 2006.

T-18-OR
Turning Point for US Diets? Economic Effects or Behavioral Shifts in Foods Purchased and Consumed
Shu Wen W. Ng, Meghan M. Slining, Barry M. Popkin Chapel Hill, NC

Background: In the past decade, the US has seen plateauing levels of obesity. However, these observed trends occurred during a period of significant economic turmoil (Great Recession, continued economic stagnation, and food price increases). Consequently it is unclear whether trends in obesity prevalence and energy intake are related to these events or more sustained shifts in diet behavior. Methods: We use a combination of nationally representative cross-sectional surveys on intake, and longitudinal household food purchase data along with random effects models to provide some sense of why these changes are occurring. This included Individuals in the 1989-91 and 1994-98 Continuing Survey of Food Intakes by Individuals (children N=13,016; adult N=11,239), National Health and Nutrition Examination Surveys 2003-04-2009/10 (children N=13,422; adult N=10,791); and Households who participated in the 2000-2011 Nielsen Homescan Panel (households with children N= 57,298; households with adults only N=108,932). Results: Until 2003, average caloric intakes rose over all groups and then reversed particularly for children with a larger decline in recent years. Even after controlling for important economic and socio-demographic factors, food and beverage purchases also fell, particularly for households with children. The Great Recession was associated with small increases in caloric purchases. Modeling results also suggest that behavioral shifts in caloric purchases started in 2001 for households with children and were driven more by declines in caloric purchases from beverages than from food. Conclusions: US consumers have exhibited changes in intake and purchasing behavior since 2003. These changes are not explained by the Great Recession or food prices. Public health efforts in the past decade may have made contributed to this trend.
ORAL ABSTRACTS – THURSDAY, NOVEMBER 14, 2013

T-19-OR
Non-Alcoholic Fatty Liver Disease: Possible Roles of Hepatic FFA Uptake, VLDL Secretion, Liver Sphingolipids and Fat Oxidation
Natali C. Breunig, Sanjini Rathi, Tracy, Nicole S. Woodward, Todd A. Kellogg, Michael L. Kendrick, Florencia G. Que, Michael D. Jensen

Background: Non-alcoholic fatty liver disease (NAFLD) has serious metabolic and hepatic consequences. Relative contributions of hepatic free fatty acid (FFA) uptake versus oxidation and/or VLDL-triglyceride (TG) secretion (Ra) to NAFLD is unknown, nor is much known about FFA trafficking into lipid signaling molecules. The purpose of this study was to test if those with elevated liver fat have greater hepatic FFA uptake, reduced VLDL-TG Ra and palmitoyl-carnitine (an oxidation index), or altered sphingolipids.

Methods: 25 volunteers (10 men) undergoing bariatric surgery were included. The day before surgery VLDL-TG Ra was measured with an infusion of ex vivo labeled VLDL-TG. A [U-13C]palmitate infusion and [3H]palmitate bolus were given during surgery, blood and liver biopsy samples were collected to measure hepatic palmitate uptake, liver fat, as well as palmitoyl-carnitine and sphingolipids (LC/MS/MS).

Results: Liver fat averaged 54±4%; 40% had >5% (the steatosis cut-point). Hepatic palmitate uptake (7.3±1.4 mmol/g/min) was not associated with % liver fat. Likewise, VLDL-TG Ra (100±37 mmol/min) was not related to either hepatic palmitate uptake or % liver fat. We noted a curvilinear relationship between % liver fat and both hepatic palmitate uptake and VLDL-TG Ra (both increased in those with <5% lipid and decreased in those with >5% lipid). Palmitoyl-carnitine (0.15±0.01mmol/g) was unrelated to % liver fat, hepatic palmitate uptake or VLDL-TG Ra. Total liver ceramides (214±45nmol/g) were not correlated with liver fat. Sphingosine-1-phosphate (1.08±0.26nmol/g) was significantly associated with VLDL-TG Ra (r=0.45; p=0.03). Conclusions: Our data suggest a possible adaptive response to hepatic fat accumulation with down-regulation of hepatic FFA uptake and VLDL-TG Ra as liver fat exceeds 5%. More research is needed regarding sphingosine-1-phosphate and VLDL-TG Ra.

T-20-OR
Effect of Roux-en-Y Gastric Bypass on Fasting and Postprandial Plasma Concentrations of Bile Acids and Fibroblast Growth Factor 19 Growth Factor-19
Saachi Sachdev New York, NY; Charles J. Billington, Sayeed Ikramuddin Minneapolis, MN; William B Inubnet, Leaque Ahmed New York, NY; Qin Wang, John E. Connott Minneapolis, MN; Streamon Chua Bronx, NY; Judith Kornet New York, NY

Background: The mechanisms by which Roux-en-Y gastric bypass (RYGB) improves T2DM likely include changes in gut hormones that regulate glucose homeostasis. Bile acids (BAs) and fibroblast growth factor 19 (FGF19) are nutrient responsive hormones with several positive metabolic effects. BAs stimulate FGF19 and GLP-1 secretion and regulate hepatic insulin sensitivity, gluconeogenesis, and glycogen synthesis to improve glucose tolerance. FGF19 alters BA homeostasis and also improves glucose tolerance. The aim of this study was to quantify changes in plasma levels of BAs and FGF19 after RYGB.

Methods: This is an ancillary investigation of the Diabetes Surgery Study, a multicenter trial of 120 patients with T2DM randomized to medical management or RYGB. Fasting and postprandial blood samples after a standard meal were drawn prior to and 1 year after RYGB. Samples from the first 15 patients at 2 study sites who completed the 1 year visit were analyzed. Area under the curve (AUC) from 0-120 minutes was computed.

Results: One year after RYGB there was 29% weight loss, and decreases in fasting glucose from 229 to 116 mg/dl, glucose AUC from 559 to 322, and HbA1c from 9.7 to 6.4%. Total BA increased most markedly in the postprandial state (AUC 6.6±1.3 to 15.2±2.6; P<0.003); while fasting levels changed from 1.7±0.4 to 2.8±0.6 μM, P=0.1. The composition of BA species changed only in the fasted state with an increase in unconjugated primary BA (12 to 18% of total BA; P<0.06), a decrease in unconjugated secondary BA (30 to 23%; P<0.03), but no change in % conjugated BA. FGF19 levels increased in both the fasted (93±15 to 152±19 pg/ml; P=0.008) and postprandial state (AUC 208±37 to 408±72; P=0.1). Conclusions: The results of this study are consistent with the idea that an increase in BA after RYGB may facilitate improved glucose homeostasis in part through stimulation of FGF19 secretion.

T-21-OR
Ethnic Differences in Adipocyte-Derived Exosomes
Evan P. Nadler, Sarah C. Ferrante, Robert J. Freishtat, Samantha Sevilla, Emily Koeck, Zuiyi Wang, Dinesh Pillai, Monica J. Hubal Washington, DC

Background: Mechanistic links between adiposity and non-alcoholic fatty liver disease (NAFLD) are poorly understood. Adipose tissue releases exosomes containing miRNAs that can travel to and affect target organs, including liver. We hypothesize that ethnic disparities in non-alcoholic fatty liver disease (Hispanics at highest and African Americans at lowest risk) could be, in part, due to adipose-derived exosomal miRNA effects on liver. Our aim was to test for exosomal miRNA differences between Hispanics (H) and African Americans (AA) in lean and obese adolescents.

Methods: Exosomes were isolated from adipose collected from lean (L, N=4; 2H, 2AA; avg BMI 23 kg/m2) and Class III obese (Ob; N=6; 2H, 4AA; avg BMI 41±2 kg/m2) females. Paired visceral and subcutaneous adipose samples were collected for each subject. Exosomal miRNA were isolated and analyzed via global microarray analysis (Affymetrix Genechip miRNA 3.0 arrays). Results were analyzed in Partek Genomics Suite software using a RAHCANOVA (ID*:obese/lean*ethnicity; age covariate).

Results: Seven miRNAs were significantly different (p<0.02) between H and AA groups, with the most highly expressed being miR-4716-3p and miR-3611. miR-4716 was upregulated in both lean (+2.6 fold H/AA; p=0.007) and obese (+1.9 fold; p=0.002); but was unaffected by obesity in either ethnicity. miR-3611 was upregulated in both lean (+2.2 fold H/AA; p=0.01) and obese (+1.5 fold; p=0.002) groups; unaffected by obesity in AA but -1.8 fold downregulated in obese versus lean Hispanics (p=0.01). Pathway analysis revealed several liver-inflammation related transcripts predicted to be affected by miR-4716 (ACVR2B, INSR, MMP2) and miR-3611 (ADIPQ).

Conclusions: The current findings suggest ethnic differences in adipose-derived exosomal miRNA expression that could potentially underlie the ethnic disparities in patients with NAFLD.

T-22-OR
Metabolic and Gut Health Impacts of Early Nutritional Intake of Fiber or Protein in Response to High Energy Dietary Challenge in Later Life
Dolan Champa C. Saha, Raylene A. Reimer Calgary, Canada

Background: Large shifts in dietary composition across the various developmental periods can provoke perturbations in metabolism that ultimately increase the risk of obesity. Alterations in hepatic gene and intestinal microbiome profile are linked with dietary deviations and could explain some of the heightened risk of obesity seen in the context of developmental programming. Our goal was to study the contribution of these factors to the effects seen when rats are confronted with a high energy diet in adulthood following developmental diets high in protein or prebiotic fiber. Methods: From 3-12 weeks of age, Wistar rats were fed a control (C), high prebiotic fiber (HF) or high protein (HP) diet. They were then switched to a high fat/sucrose (HFHS) for 6 weeks before reverting back to their initial diets for another 4 weeks. Quantitative and real-time PCR were used to assess the gut bacterial composition and liver genes respectively. Results: Body fat (%) and weight gain was lowest in HF at study termination. HF decreased the ratio of Firmicutes/Bacteroidetes and increased Bifidobacterium spp (p<0.05). Bacteroides and total bacteria negatively correlated with percentage body fat and body weight. HF altered liver metabolism through increases in the liver mRNA genes for cholesterol synthesis. HF also promoted increased cholesterol excretion and thus resulted in lower hepatic cholesterol (p<0.05).

Conclusions: Thus a high dose of prebiotic fiber early in life imparts better outcomes of health in adulthood compared to those on HP diet. This study suggests that the effects of prebiotic fiber in altering long-term health involves, in part, changes in lipid metabolism and gut microbiota, which in turn may be involved in a defensive response to a high fat diet.
T-23-OR
Caloric Restriction Increases the Anti-Obesity Effects of Central Leptin in Middle-Aged Rats
Virginia Lopez Gomez-Carreño, Elena Bonzón-Kulichenko, Teresa Fernández-Aguiló, Eduardo Molto, Carmen Arribas, Antonio Andrade, Nilda Gallardo Ciudad Real, Spain

Background: As aging is a significant risk factor for the development of obesity and hepatic steatosis associated with insulin and leptin resistance, we hypothesized that livers from caloric restricted middle-aged rats may be more sensitive to the anti-obesity actions of central leptin than livers from ad libitum fed middle-aged rats. Methods: 5-months old Wistar rats with free access to standard food and water were randomly assigned and maintained during 3-months in two different groups: ad libitum (AL) or caloric restricted (CR). At 8-months of age, the AL and CR rats were centrally treated with rat leptin (0.2 μg/day) or saline, fed AL or pair-fed to the amount of food consumed by the leptin-infused rats (PF), for 7 days. Plasma concentrations of insulin, leptin, glucose, TAG, NEFA, and KB were measured in overnight-fasted rats. The mRNA and total protein levels of several lipogenic enzymes ACC, ACL, FAS, SCD1, and transcription factors of lipid metabolism SREBP-1c were studied by real-time PCR and immunoblotting.

Results: As expected, central leptin administration reduced food intake, and this was accompanied by body weight loss in 8-months-AL fed rats, while these central effects of leptin were not observed in 8-months-CR rats, animals with a body weight equivalent to ~ 80% of AL fed aged-mates. Nevertheless, central leptin infusion significantly reduced TAG plasma levels in 8-months-CR but not in AL fed rats. According to previous data in rats with central leptin sensitivity, leptin markedly decreases SREBP-1c, ACC, ACL, FAS, and SCD-1 mRNA levels in the liver of 8-months CR rats, but not in AL fed rats where the effect of leptin was low or even slightly increased FAS and SCD-1 mRNA levels compared to PF rats. Conclusions: Caloric restriction is required to normalize the anti-obesity actions of central leptin in hyperleptinemic middle-aged rats.

T-24-OR
This abstract has been withdrawn.

3:00 PM – 4:30 PM
Oral Abstracts Track 2 - Neuronal Control of Satiety
T-25-OR
Weight Lowering Effects of the GLP-1 Analog Liraglutide Requires CNS GLP-1 Receptors
Stephanie Sisley Houston, TX; Ruth Gutierrez-Aguilar, Darleen Sandoval, Randy Seeley Cincinnati, OH

Background: GLP-1 analogs have potent effect to improve glucose regulation and decrease body weight. GLP-1 receptors are found in the CNS and in the peripheral nervous system. The key question is the degree to which these receptors are necessary for the normal regulation of body weight and glucose control and the response to GLP-1 analogs. Methods: To address this question, we developed mouse models where we selectively reduced expression of the GLP-1R in the CNS or in the nodose ganglia of the vagus nerve that innervates the hepatic portal use cre-LoxP approach. Results: Neither GLP-1R in the CNS or nodose ganglia appeared to play an essential role in normal body weight regulation on either chow or a high-fat diet. However, CNS GLP-1Rs are necessary for the anorectic effects of the once-daily GLP-1R agonist liraglutide but the nodose ganglia receptors are not. Interestingly, CNS GLP-1Rs are not important for either normal glucose tolerance nor the glucose-lowering effects of a once daily GLP-1R agonist. Conclusions: The GLP-1 receptor in the CNS would appear to be an important target of the effects of liraglutide to reduce food intake, body weight and body fat.

T-26-OR
The GLP-1 Analog Liraglutide Is Taken Up in CART Neurons in the Hypothalamus and Regulates Appetite Through Arcuate Nucleus Signaling
Anna Secher Måler, Denmark; Jacob Jelsing Horsholm, Denmark; Laufe Schäffer, Jacob Hecksher-Sorensen Måler, Denmark; Niels Vrang Horsholm, Denmark; Lotte Bjerre Knudsen Måler, Denmark

Background: Liraglutide is in clinical development for the treatment of obesity and lowers food intake and body weight in several species, including humans. The mechanism for this appetite lowering is believed to involve central mechanisms but no clear evidence exists of liraglutide action in the brain.

Methods: Rats were dosed peripherally with fluorescently labeled (fluoro) liraglutide to address if liraglutide accesses the brain and affects appetite regulating signals. Results: Arab liraglutide was located in all circumventricular organs including the median eminence (ME), but was also detected in the arcuate (ARC), paraventricular (PVN), and dorsomedial (DMH) hypothalamic nuclei, which have all been shown to express the GLP-1 receptor. The signal intensities were quantified in the hypothalamus, with a ratio of 0.9 between ARC and ME, and 0.3 between PVN and ARC. Double fluorescence microscopy showed that (fluoro)liraglutide accumulated in the cytoplasm of the cocaine- and amphetamine regulated transcript (CART) neurons, with an almost complete co-localization between CART and (fluoro)liraglutide. In mice dosed for 4 days, we observed the same localization of (fluoro)liraglutide except for higher fluorescent intensities in the PVN. Selective PVN ablation in rats did not affect the suppression of food intake and body weight induced by liraglutide. This suggests that PVN is not an important primary site for liraglutide mediated appetite regulation. Earlier experiments showed that liraglutide increases CART mRNA levels in ARC. Thus, the data suggest that liraglutide controls appetite regulation via direct action on CART neurons in ARC.

Conclusions: Liraglutide is able to access the brain following peripheral administration and appears to lower food intake and body weight by a direct action on CART neurons in the ARC, independently of PVN signaling.

T-27-OR
Liraglutide Binds to and Internalizes with the GLP-1 Receptor (GLP-1R) in Appetite-Regulating Regions of the Brain
Jacob Hecksher-Sørensen, Anna Secher, Lange Schäffer, Jonas Ahnfelt-Ramne, Charles Pyke, Lotte Bjerre Knudsen Måler, Denmark

Background: The GLP-1R is expressed in various tissues where it regulates metabolic homeostasis. In particular, the GLP-1R is expressed in beta cells where its activation improves insulin secretion. For years, GLP-1 analogs have been used for treatment of type 2 diabetes. Liraglutide is a once-daily human GLP-1 analog shown to lower body weight in obese patients without diabetes, raising the possibility that GLP-1 may be used to treat obesity. However, mechanisms underlying this aspect are being debated. There is substantial evidence that GLP-1 analogs can induce weight loss when delivered directly into the brain. It remains unknown if peripheral liraglutide can cross the blood brain barrier and activate these signaling cues. Methods: We generated fluorescently labeled GLP-1 analogs and examined how they distributed in the body after peripheral administration in mice. Results: We showed at whole organ level that peripherally administered (fluoro)liraglutide bound to and internalized with GLP-1R in pancreatic beta cells and hypothalamic regions containing appetite-regulating neurons such as the arcuate nucleus, paraventricular nucleus and dorsomedial hypothalamic nucleus. We suggest that the internalization of liraglutide can be directly linked to activation of GLP-1R as no internalization was seen with the antagonist (fluoro)exendin-9-39. Subcellular resolution revealed that this molecule also bound to the GLP-1R but only labeled the plasma membrane. Accumulation of (fluoro)liraglutide in the hypothalamus appears to be entirely dependent on GLP-1R binding as no signal could be detected in GLP-1R deficient mice. Conclusions: We conclude that peripherally administered (fluoro)liraglutide reaches appetite-regulating regions in the brain where it binds to and internalize with the GLP-1R, indicating a direct central effect of liraglutide on appetite regulation.

Obesity 2013, The 31st Annual Scientific Meeting of The Obesity Society For author conflict of interest information, see page S264
IL-1 and IL-6 activity led to a more potent attenuation of exendin-4 effects. Furthermore, we show that the central IL-6 and IL-1 may be necessary mediators of anorexigenic effects without changing the expression of other inflammation-associated genes. The cytokines IL-6 and interleukin-1β (IL-1β) have been reported to exert a tonic anti-obesity effect in the CNS during health. 

**Methods:** Here we determine whether brain GLP-1R stimulation-induced anorexia, body weight reduction along with changes in energy expenditure are mediated by interleukins in rodents utilizing behavior- and neuropharmacological methods. 

**Results:** In this study we found that central injection of a clinically used GLP-1 receptor agonist, exendin-4, potentiated the expression of IL-6 in the hypothalamus (11-fold) and the hindbrain (4-fold) and of IL-1β only in the hypothalamus, without changing the expression of other inflammation-associated genes. Furthermore, we show that the central IL-6 and IL-1β may be necessary mediators of the anorexigenic and weight loss response to GLP-1 stimulation. Supportively, pharmacologic disruption of IL-1β or IL-6 biological activity attenuated exendin-4 induced anorexia and body weight loss. Simultaneous blockade of IL-1β and IL-6 activity led to a more potent attenuation of exendin-4 effects on food intake, in addition to inhibition of exendin-4 induced body weight loss.

**Conclusions:** These data outline a previously unidentified role of the central IL-6 and IL-1β in mediating the central anorectic and weight loss effects of GLP-1 receptor activation.
verse correlation between the change in serum 25OHD, insulin, and HOMA, serum 25OHD concentrations modestly suppress markers of insulin resist-
ance. The goal in this study is to determine whether vitamin D3 supplementation influences fasting plasma glucose and insulin resistance in overweight/obese women. Methods: Forty-seven postmenopausal women (30.9 ± 4.1 kg/m²; 58 ± 6 y) were recruited and randomized to one of 3 doses of vitamin D (600, 2000, and 4000 IU/day) in a randomized double blind manner for 1 year with biweekly and then monthly nutrition education/be-
havior modification classes for weight control. Women were enrolled if serum 25OHD was < 30 ng/mL, BMI 25-40 kg/m² and were considered healthy without diabetes. Serum glucose and insulin, oral glucose tolerance test (OGTT; area under the curve, AUC) were examined, and Homeostasis Model Assessment (HOMA) was calculated. Statistics included ANCOV A test (OGTT; area under the curve, AUC) were examined, and Homeostasis Model Assessment (HOMA) was calculated. Statistics included ANCOVA and Pearson’s correlations. Results: Baseline fasting serum 25OHD, glucose and insulin were 26.3 ± 6.3 mg/dL, 83 ± 10 mg/dL, and 4.1 ± 2.3 uIU/mL, re-
spectively in a subset of women (n=36) who completed the study. After 1 y, serum 25OHD differed significantly between groups. In addition, after con-
trolling for baseline glucose concentrations, the change in glucose differed between vitamin D groups and showed a trend for HOMA. There was an in-
verse correlation between the change in serum 25OHD, insulin, and HOMA, and the OGTT AUC (p < 0.05). Conclusions: These data suggest that higher serum 25OHD concentrations modestly suppress markers of insulin resist-
ance in overweight/obese older women. Supported by NIH-AG12161.

T-34-OR
Cost Effectiveness of Medically Supervised Weight Loss
Clay P. Wisse, Vincent Pera Providence, RI
Background: Obese individuals often require numerous comorbidity-related medications, which increase both adverse medication effects and healthcare expenses. Considering that the average obese adult has $8,315 in annual medical expenses—$2,460 more than an average adult at a healthy weight—weight loss may have as much economic as well as health benefits. We hypothesize that medically supervised weight loss significantly decreases the medication burden for gastro-esophageal reflux disease (GERD), hypertension, hyper-
lipidemia, and diabetes. Methods: This is a retrospective crossover study of 589 patients who participated in a medically supervised multidisciplinary be-
havioral weight management program for 16-24 weeks. All changes to med-
ications were made based on clinical guidelines. Monthly wholesale medication expenses were calculated using national data. Results: Starting weight averaged 247.4 (STDEV 64.50) lbs and weight lost averaged 44.4 lbs (95% CI 42.1, 46.7). On average the wholesale monthly cost of medications decreased by $72.85 by the end of treatment (95% CI 63.18, 85.77). Notably, for those with a diagnosis of diabetes, the decrease was $214.91 (95% CI 169.91, 261.42); hyperlipidemia, $123.87 (95% CI 102.69, 146.73); hyper-
tension, $107.21 (95% CI 86.53, 131.72); GERD, $81.19 (95% CI 65.40, 97.57). A multivariate linear model adjusted for physician visits demon-
strated that total weight loss, number of nutrition and exercise counseling sessions attended, previous diagnosis of hypertension and hyperlipidemia, as well as number of initial medications were all positively correlated (p<0.05) with percent decrease in monthly wholesale medication costs. Conclusions: Weight loss in a medically supervised setting reduces medication burden and associated cost. Furthermore, the decrease in expense is strongly correlated with the degree of weight loss.

T-35-OR
Depression and Weight Loss (WL) Over 2 Years in Obese and Overweight Subjects Receiving Phentermine and Topiramate
Patricia M. O’Neil Charleston, SC; Craig A. Peterson Mountain View, CA
Background: Although obesity and depression are reciprocally related, most clinical trials of obesity medications exclude patients on antidepressants. A 2-
year trial of PHEN/TPM ER included subjects on selected antidepressants (including SSRIs and SNRIs) and/or with a depression history. This post hoc analysis evaluates incident depression and WL in these subjects (depression cohort) and in those with no history of depression and no antidepressant med-
ication use (non-depressed cohort). Methods: Obese/overweight subjects (BMI ≥27 and ≥45 kg/m²) with ≥2 weight-related comorbidities who com-
pleted the 56-week CONQUER trial at selected sites were eligible to enroll in a 52-week extension (SEQUEL) and remained on their original randomized, blinded treatment: placebo (PBO; n=227), PHEN 7.5mg/TPM ER 46mg (7.5/46; n=153), or PHEN 15mg/TPM ER 92mg (15/92; n=295). Results: Mean baseline weight was 103.8±1.7 kg in the depression cohort (n=132; 19.6% & 101.2±18.9 kg in the non-depressed cohort (n=543; 80.4%); 68% of depression cohort subjects were on antidepressants. Although incidence of depressive symptoms was higher in the depression cohort versus the non-depressed cohort, within each cohort, no significant differences were observed between PHEN/TPM ER and PBO in treatment-emergent depressive symp-
toms, major depression, or mean change in Patient Health Questionnaire-9 score (P>NS vs PBO, all comparisons). Week 108 least-squares mean percent WL (±SE) in the depression cohort was 2.9±1.2%, -11.6±1.8%, and -13.5±1.0% for PBO, 7.5/46, and 15/92, respectively, with a similar treat-
ment effect in the non-depressed cohort (P>0.001 vs PBO, all comparisons). Conclusions: At 2 years, PHEN/TPM ER led to significant WL vs PBO, with no increase in incident depression vs PBO, regardless of baseline de-
pression status. Funded by VIVUS, Inc.

T-36-OR
Dynamical Systems Modeling of Caloric Intake and Body Composition with Combination Naltrexone/Bupropion Therapy
Kevin D. Hall, Arjun Sanghvi Bethesd, MD; Kye M. Gilder, Frank Cerasoli, Brandon Walsh La Jolla, CA; Steven R. Smith Winter Park, FL
Background: Little is known about how obesity pharmacotherapy affects free-living energy intake (EI) or whether changes in fat mass (FM) and vis-
ceral adipose tissue (VAT) are different with pharmacotherapy-induced weight loss compared with those achieved by diet/exercise interventions. Methods: Dynamical Systems Modeling was applied to a subset of subjects (N=214; age 44 y, 86% female, BMI 36 kg/m²) of a Phase 3 randomized, double-blind, placebo (PBO)-controlled, 56-week clinical trial (COR-I) of sustained-release (SR) naltrexone/bupropion (NB) who had FM measured by DEXA at baseline and week 52. 116 subjects also had multi-slice abdominal CT scans to measure VAT. The model used baseline body composition and monthly weight data to estimate changes in EI (kcal/day), FM, and VAT mass. Results: Compared with PBO, NB reduced FM (-12% vs. -4%, p<0.01) and VAT (-13% vs. -5%, p=0.069). During the first 22 weeks of the study (weight change: NB -6.6±0.6% vs. PBO -2.7±0.6%; p=0.001), the cal-
ed EI change from baseline with NB was -545±51 kcal/day vs. -229±58 kcal/day with PBO (p=0.001). After week 22, NB subjects averaged a further -1.2±0.6% weight loss and maintained a reduction in EI from baseline (-
181±40 kcal/day). In contrast, PBO subjects tended to regain weight during this period (+0.9±0.5%) and no longer reduced EI from baseline (-3±36 kcal/day; p=0.001 vs. NB). The mathematical model accurately predicted observed changes in both FM (r=0.96, p<0.001) and VAT mass (r=0.90, p<0.001), both of which were consistent with diet/exercise interventions. The VAT model used an allometric constant k = 1.3 for VAT/FM loss and did not differ between PBO and NB. Conclusions: Treatment with NB resulted in a significant and sustained reduction in EI throughout the clinical trial and a pattern of FM and VAT reduction similar to that observed with diet/exercise.
we identified a locus on chromosome 4q12 which has a significant influence on the variation in BMI, waist circumference and waist-height ratio.

**Methods:** We conducted high-density single nucleotide polymorphism (SNP) genotyping in the one-logarithm-of-odds (LOD) confidence interval of 8q12 to assess the association of genetic variation in the interval and obesity-related phenotypes. **Results:** We found strong evidence of association between syntenin (or sydne-c bend protein (SDCBP)) and obesity-related phenotypes. Syntenin SNP rs8734314 showed strong association with the following obesity measures; waist (p=4.0×10-8) and hip (p=9.1×10-8) circumferences, percent body fat as measured by biometry (p=3.6×10-7), body weight (p = 1.6×10-6) and BMI (p=6.0×10-7). The minor allele frequency was 0.06 in this population and corresponded with an increase in each of the obesity-related phenotypes shown above. These associations were consistent across two examinations approximately 5 years apart. Further investigation using transcriptional profiling revealed this rarer SNP allele is associated (p=0.0089) with decreased syntenin expression levels in lymphocytes from these same individuals. **Conclusions:** The association of syntenin mRNA level with the associated rs8734314 supports syntenin as a key player in the observed QTL and regulation of obesity-related phenotypes.

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**T-38-OR**  
Meta-Analysis of SNP Associations with Body Mass Index in Up to 339,000 Men and Women Identifies 97 Loci and Gives Novel Insights Into the Genetic Underpinnings of Obesity

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**Background:** Large genome-wide associations studies (GWAS) have identified many loci that are unequivocally associated with obesity-related traits. **Methods:** To expand our understanding of the genetic underpinnings of obesity, we conducted a fixed effects meta-analysis of SNP associations with body mass index (BMI), the most commonly used measure of obesity, in up to 339,224 individuals from 125 association studies. **Results:** We confirmed 40 established obesity loci and identified 57 novel loci associated with BMI (p < 5×10-8). Consistent with previous BMI GWAS, the large majority of loci contain genes that have a potential central nervous system (CNS) role. However, integrating gene expression, coding variant, literature connection, co-expression, protein-protein interaction, animal model systems, and pathway database information, we additionally implicate novel CNS processes such as synaptic function, cell-cell adhesion and glutamate signaling (PCDH9, CADM2, NRXN3, NEGR1, GRIN1), as well as peptide biology (GPR3, SGCG), lipid metabolism (NPC1, DGKG), and glucose/insulin action (RPTOR, FOXC3, TCF7L2, GIPR, IRS1). Interestingly, whereas most of the BMI loci have effects on related metabolic diseases/trait in the expected epidemiological directions some SNPs displayed unexpected patterns of association with the BMI-increasing allele being protective for disease risk (TCF7L2 for T2D and IRS1 for CVD, P < 0.0005). Such information begins to define a shared genetic etiology between BMI and metabolic disease, which may help explain why some but not all obese individuals develop downstream disease. **Conclusions:** In summary, our study results greatly enhance our understanding of the etiology of obesity and may therefore allow for the development of new ways to prevent and treat obesity and its complications.

**T-39-OR**  
Genome-Wide Joint Meta-Analysis of Gene by Smoking Interaction on Waist Circumference: The GIANT (Genetic Investigation of Anthropometric Traits) Consortium

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**Background:** Cigarette smokers often display lower body weight than non-smokers, and both men and women gain weight after smoking cessation leading to changes in central adiposity. Previous studies have identified genetic loci that increase central adiposity. Yet, little is known about whether current smoking status (SMK) influences these genetic associations. We aim to discover genetic loci that interact with smoking to influence central adiposity, measured as waist circumference adjusted for BMI (WC), and to increase power to detect genetic main effects that may be hidden when smoking behavior is not considered. **Methods:** We assessed results from 42 studies including up to 113,587 subjects with GWAS data available through the GIANT Consortium. We conducted inverse-variance weighted fixed-effects meta-analyses of the study specific results for four association models, separately and combined across sex, designed to assess main effects (stratified by and also adjusted for SMK), SNP x SMK interaction effects, and a joint effect of SNP on WC and the SNP x SMK interaction effect. **Results:** A total of 63 loci reached Genome-Wide significance (GWS) (p<5×10-8) in one or more models. Of the 63 novel WC SNPs, seven have been previously associated with waist traits, 11 with other adiposity traits, and one with smoking behavior. One novel association near PRNP reached GWS for SNP x SMK interaction alone in women. Many GWAS SNPs lie near strong biological candidates important in early growth and development (e.g. DNM3TA, TBX15, FGFR4) and nervous system functioning (e.g. CABLES1, DOCK3, PRNP). **Conclusions:** We have greatly increased the number of loci associated with central adiposity and highlight the influence of novel biological processes that act on WC, highlighting the importance of accounting for SMK when investigating the genetic underpinnings of central adiposity.
SNPs with BMI and WHR in four strata (men <50y, men ≥50y, women <50y, women ≥50y). We performed stratum-specific meta-analyses. Subsequently, focusing on SNPs that showed significance at P<1E-5 in the combined strata, we compared estimates across the four strata for age or sex differences using heterogeneity tests at 5% FDR. Results: For BMI, we identified 11 known and 2 novel loci (near COBLL1 and DDC) with age-specific differences, of which 10 had stronger effects in the younger group. Three loci with stronger effects in the older age group have been previously associated with type 2 diabetes (TCF7L2), LDL (APOC1) and HDL (COBLL1). For WHR, we identified 22 known and 3 novel loci (near MSC, GANAB, and RPS6KA5) that differed by sex. All but three loci had more pronounced effects in women compared to men. Finally, heterogeneity tests between the four strata suggested age- or sex- dependencies for three BMI loci (SEC16B, TSHZ2 and COBLL1) and one WHR locus (near BMP2).

Conclusions: Our results emphasize sex and age specific genetic effects for body composition and possibly shed light onto the biology that underlies these differences.

T-41-OR
Genetic Variation in Neural Signaling Pathways and Exercise Adherence in the TIGER Study
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Background: Physical activity and exercise play critical roles in energy balance. While many interventions targeted at increasing physical activity have demonstrated efficacy in promoting weight loss or maintenance in the short term, long term adherence to such programs is not frequently observed. The purpose of this study was to examine the role of genetic variation in influencing exercise adherence and tolerance. Methods: A total of 26 SNPs in 6 candidate genes in pathways related to neural signaling were examined for association to exercise adherence, duration, intensity, and total dose in 885 participants (males=333, females=552) from the TIGER Study. Subjects underwent 15 weeks of monitored aerobic exercise training, and exercise dose was calculated based on total minutes of exercise, adjusted for exercise intensity. Adherence was defined as meeting the prescribed exercise dose.

Results: After controlling for age, gender, BMI, and genetic admixture, variants in genes within the serotonin signaling pathways were nominally associated with exercise adherence (rs6314 and rs9546015, p<0.005), dose (rs6314, p<0.006), duration (rs9546015, p<0.03) and intensity (rs1801412, P<0.05). Variation in the DRD4 gene was nominally associated with exercise duration (rs3758653, p<0.04). Variants in the DRD2, BDNF and BDNFOS genes were not associated with adherence or other exercise parameters in this study.

Conclusions: Physical activity has been shown to have a strong genetic component in both animals and humans but relatively little is known about how genetic variation may influence exercise adherence. Neural signaling and pleasure/reward systems in the brain may drive in large part the propensity to be physically active and to adhere to an exercise program.

T-42-OR
Identification of Variants That Impact Rate of Weight Gain Predominately in Childhood
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Background: Prior studies have suggested that genes that contribute to an obese phenotype may have differing effects during childhood versus adulthood. The goal of this study was to determine if 30 single-nucleotide polymorphisms (SNPs) previously associated with maximum lifetime BMI in our genetic studies for obesity in American Indians differed in their effect on rate of weight change during childhood compared to adulthood. Methods: Subjects had both genotypic data and longitudinal measures of weight, height and responses to a 75g oral glucose tolerance test. Those individuals with at least two non-diabetic, non-pregnant examinations, at least 2 years apart, during childhood (5-20 years of age, n=2877) or adulthood (20-45 years of age, n=2697) were included in this study. The slope of BMI change per year was computed and associations of genotype with BMI change/year, adjusting for sex, degree of Pima heritage, and birth year (to account for secular change), were assessed by linear regression analysis using an additive model. Results: Of the 30 SNPs, 11 were associated with rate of BMI change in childhood but not adulthood (all p<0.05), and none were associated with rate of BMI change in adulthood but not childhood. The most significant finding was with rs7278294 which maps to the Down Syndrome cell adhesion molecule (DSCAM) gene on chromosome 21, which is involved in neural development. Conclusions: Among 30 SNPs previously associated with maximum lifetime BMI in American Indians, approximately one third impacted rate of weight change in childhood but not adulthood. This supports the role of early childhood intervention to prevent obesity.

T-43-OR
A Time Series Analysis of Pricing and Display Interventions Targeting Beverages in a Large Workplace Cafeteria
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Background: Few studies are available to determine whether point-of-purchase interventions can change beverage selections. Methods: In a large financial services company cafeteria, we conducted interventions targeting beverages: 1) a price increase on high-calorie beverages (>50 kcal) of 1 cent/ounce, and 2) displaying beverages ordered by calorie content: “zero-calorie” (0 to 15 kcal), “low-calorie” (45 to 149 kcal), “high-calorie”. The baseline period was September 2011; each intervention lasted 3 months, separated by a 2-month washout period. We used interrupted time series analyses to examine the effect of the interventions on sales. Results: During baseline, the sales of zero-, low-, and high-calorie beverages were 151, 58, and 99 beverages/day. After the price increase, we found an immediate increase (change in level) of 39 zero calorie bev/d (95%CI 25, 54), a 26% increase compared to mean sales at baseline. For high-calorie beverages, we observed declines in both level (-16 bev/d, 95% CI -8, -24) and trend (-0.3 bev/d, 95% CI -0.1, -0.5) after the price increase. The level change was a 16% decline in sales compared to the mean at baseline. During the washout period, sales of zero-calorie beverages further increased with stability in sales during the display phase. For high-calorie beverages, we saw increases in level (12 bev/d, 95% CI 1, 22) and trend (0.5 bev/d, 95% CI 0.1, 0.8) during the washout period, but then a reduction during the display phase in trend only (-0.3 bev/d, 95% CI -0.2, -0.8). Throughout the study period, low-calorie beverage sales followed a similar pattern to zero-calorie beverages. Conclusions: Both increasing high-calorie beverage prices and displaying beverages by calorie content altered sales. The most consistent effect was decreasing sales of high calorie beverages during both intervention phases.

T-44-OR
The Impact of Urbanization on Community Food Environments: Results from the China Health and Nutrition Survey
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Background: To study the impact of urbanization on various components of the food environment, including the local restaurants and food stalls; community food prices; community norms for nutrition knowledge, fast food preferences and fast food consumption. Methods: Longitudinal data from 1989-2009 China Health and Nutrition Survey. Urbanicity index was assessed using an adapted urbanicity scale with ten elements from a survey of community informants. Information on the food environment was also retrieved from the community survey. Final analysis included 216 communities from nine Chinese provinces. Random-effect models were used for analysis. Results: Urbanicity in the urban environment increased odds of fast food restaurants (OR=2.78, 95% CI: 2.18-3.54) and other indoor restaurants (OR=2.93, 95% CI: 2.28-3.76) within the community, as well as increased odds of supermarkets (OR=2.43, 95% CI: 2.04-2.89) and free markets (OR=2.56, 95% CI: 1.77-3.70) within 30 minutes’ bus ride from the community. Prices for apples (β=0.06, 95% CI: 0.04-0.08) and lean pork (β=0.02, 95% CI: 0.01-0.03) increased with urbanicity, while prices for other food items did not. A positive association was found between urbanicity and community norms for fast food consumption (RR=1.28, 95% CI: 1.22-1.33), fast food preference (RR=1.09, 95% CI: 1.06-1.12) and nutrition knowledge (RR=1.02, 95% CI: 1.01-1.03). Conclusions: Urbanization in China is associated with better access to all types of food establishments, and norms for fast food preference and consumption, and greater nutrition knowledge, but
not for food prices. These findings can inform efforts to promote healthful urbanization in China.

T-45-OR
Does Zoning for Healthy Food Access Increase the Availability of Healthy Food Outlets?
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Background: Increasing access to fruits and vegetables (F&V) is a priority for communities. This paper examines whether communities that permit certain types of healthy food outlets through zoning are associated with a higher density of healthy food outlets in the community. Methods: Zoning ordinances were obtained for jurisdictions overlapping 152 catchments where a nationally representative sample of 2470 school students were enrolled in 2010. Two zoning measures, weighted for the proportion of the catchment exposed to healthy outlet zoning, were constructed: (1) a y/n indicator of whether supermarkets, farmers’ markets, F&V stands, and/or F&V carts were permitted zoning uses; and (2) a healthy food zoning index based on the sum of the permitted uses for each outlet type. Healthy food outlets were identified through commercial food outlet lists, observations, and USDA’s Farmers’ Market locator. Healthy food outlet density equaled the sum of the number of supermarkets, farmers’ markets, and F&V markets within the catchment/square mile. Generalized linear models, clustered on catchment, examined the relationship between any healthy outlet zoning and the zoning index with outlet density controlling for race/ethnicity, median household income, region, urbanicity, and sprawl. Results: Healthy outlet zoning ranged from 0-100% of the catchment population (mean=72%); the zoning index ranged from 0-4 outlets (mean=1.29). Outlet density/square mile ranged from 0-5.8 outlets (mean=0.34). For each 10% increase in the catchment population exposed to healthy food outlet zoning, healthy food outlets increased by 0.16 per square mile (RR:1.16, 95% CI: 1.07-1.26). Zoning for healthy outlets also increased outlet density/square mile (RR:1.23, 95% CI: 1.05-1.42). Conclusions: Zoning may be a useful policy tool for increasing the availability of healthy food outlets.

T-46-OR
A Content Analysis of Public Discourse About the New York City Sugar-Sweetened Beverage Portion Limit Policy
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Background: Recently the NYC Board of Health proposed a controversial policy prohibiting the sale of SSBS >16 oz. in restaurants. This study aimed to identify (1) “pro” and “anti” portion limit policy arguments and their sources; 2) communication techniques used to influence the policy frame (e.g., calling it a “ban” vs. a “limit”); and 3) differences in these arguments and techniques based on support/opposition to the policy. Methods: We conducted a content analysis of 462 unique public testimony submissions, 139 “hard” newspaper stories, and 54 newspaper opinion pieces about the policy. Results: Across the “hard” news articles, 50% (N=367) were “pro-” arguments and 50% (N=371) were anti-policy arguments. The most common “anti” arguments were in the following categories: Preservation of freedom (36%); Policy will not work (20%); SSBS are not the right target (19%); Policy will hurt business (11%); The people did not have a vote (10%). Common “pro” arguments were: Obesity is a major problem/Policy will improve health (26%); SSBS are the right target (25%); Reducing portion sizes is the right strategy (19%); Government has a responsibility to promote public health (18%). Results for the public testimony will also be presented. Conclusions: The most common concerns about the SSBS portion limit policy centered around government encroachment on freedom, a perceived arbitrary focus on SSBS, and a lack of evidence supporting the policy’s effectiveness. Results suggest those advocating for the portion limit policy should focus communication efforts on the identified concerns and empirical data on the policy’s impact are needed.

T-47-OR
Effects of Licensed Characters on Children’s Taste and Snack Preferences in Guatemala, a Low/Middle Income Country
Paola Letona, Violeta Chacon Guatemala, Guatemala; Christina A. Roberto Cambridge, MA; Joaquin Barnoya St Louis, MO

Background: Marketing of high-energy, low-nutrient foods is one of the mayor contributing factors to the obesity-promoting environment surrounding children. There is only a small body of research documenting its negative influence on children, particularly those living in low- and middle-income countries (LMIC). Therefore, this study sought to examine whether licensed characters displayed on food packaging influence Guatemalan children’s taste and snack preferences. Methods: Children (n=121, mean ± 3 SD age, 7.4 ± 1.9 years; range, 4.3-11.5 years) tasted three pairs of identical foods (potato chips, crackers, carrots). Each food was presented in two packages, one with and the other without a licensed character. Children tasted the identical foods in each package and specified whether they tasted the same or one tasted better. They then selected the one they would prefer for a snack. Results: Children were significantly more likely to prefer the taste of foods with a licensed character on the package, compared with those in the plain package (p < 0.001). Furthermore, most children (66%) preferred the foods in the package with the licensed character for a snack. The influence of characters on the taste preference differed by age and grade. Younger children (p < 0.001) and those in pre-school (p = 0.004) were more likely to be influenced by the characters. Conclusions: Licensed characters on food packaging influenced Guatemalan children’s taste and snack preferences, particularly those of younger children. Guatemala, like other LMIC, lacks evidence-based policies to regulate marketing of high-energy, low-nutrient foods to children. Therefore, countries in general must take actions to change the obesity-promoting environment by developing policies to improve food marketing environment for children.

T-48-OR
Conditions Influencing the Adoption of a Sugar-Sweetened Beverage Taxation Policy: Reflections and Perspectives from the French Case
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Background: Recently, various organizations have pushed for the taxation of sugar-sweetened beverages to tackle obesity and raise public health funds. Whereas such proposals have often been defeated, France was one of the few countries where it came into force, in January 2012. It appears worthwhile analysing the conditions that influenced the adoption of such a controversial policy. Methods: A case study design was used to collect and analyse data from a scoping review, interviews with key stakeholders (n = 15), newspapers articles and documents from public, academic, non-for-profit and private organizations. Results: (1) Despite equivocal evidence as to its potential effects, sugar-sweetened beverages taxation proposals have been recurrent in years preceding adoption; (2) in 2011, a window of opportunity was identified by the government which precipitated the legislative process; (3) the public health motivation was not formally backed by academic and experts consultation, and was easily and strongly challenged by several stakeholders; (4) as a consequence, the public health rational was partly disregarded and budgetary considerations took precedence in political and economic arenas with key consequences for the design of the tax; (5) However, besides initial controversies, there seems to be a reasonably good acceptability of the tax in the public opinion, which may help further developments of tax-based obesity policies. A decreasing consumption has been documented although no cause to effect relationships could be firmly established. Conclusions: In such a case, what has been observed may serve as a humility lesson when public health intents to position itself as a social change agent.
in part. This recognition allows researchers to obtain more accurate estimates of treatment effects a priori, in order to design adequately powered investigations.

T-51-OR
Validation of the Thr6Lys+Val81Ile Human Melanocortin 3 Receptor (MC3R) Variant as a Cause of Obesity Using Knock-In Mice
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Background: We have previously reported that children who were homozygous for a pair of missense MC3R variants (Thr6Lys+Val81Ile) that decrease MC3R signaling had significantly greater BMI and fat mass than control children. Methods: To characterize the effects of these mutations, we generated two novel knock-in mouse models replacing the murine MC3R with either wild type human MC3R (hWT) or Thr6Lys+Val81Ile human MC3R (hMU). Results: On both chow and high fat diets, homozygous hMU mice had significantly greater body weight and body fat mass but significantly decreased fat-free mass compared to homozygous hWT. However, as observed for heterozygous Thr6Lys+Val81Ile MC3R children, heterozygous hMU mice did not exhibit any differences in body composition. Homozygous hMU mice had increased energy intake, increased feeding efficiency, and a slight reduction in energy expenditure only at thermoneutrality. Energy intake decreased after leptin injection (1 ug/g b.w) equally in homozygous hMU and hWT, suggesting that altered leptin sensitivity does not explain the greater energy intake of homozygous hMU mice. Serum adiponectin was notably increased in homozygous hMU mice (p<0.01) and despite their greater fat mass, there was no increase in adipose tissue inflammatory cell infiltration. Homozygous hMU mice had similar insulin sensitivity to lean hWT mice.

Conclusions: These data suggest that homozygosity for the human MC3R sequence variant Thr6Lys+Val81Ile alters energy homeostasis in mice at least partially by increasing food intake. In addition, despite their higher fat mass hMU mice appear to have white adipose tissue that is metabolically healthier. Further studies examining how such mutations affect peripheral tissue metabolism and how increased adiponectin may affect food intake may further reveal mechanisms through which MC3R affects energy homeostasis.

T-52-OR
Amylin and Leptin Interact in the Ventral Tegmental Area to Reduce Food Intake
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Background: Amylin, a pancreatic β-cell-derived neuropeptide, suppresses food intake by activating CNS amylin receptors. When amylin is delivered systemically with leptin, an adipose-derived anorectic hormone, the food intake and body weight suppressive effects are greater than those of either peptide alone. Investigations of the CNS nuclei mediating this interaction have been restricted to the area postrema and hypothalamus. Given the recent finding that amylin receptor activation in the ventral tegmental area (VTA) is physiologically involved in the control of food intake, and that VTA leptin receptor activation reduces food intake, it is possible that the VTA may be mediating in part the amylin-leptin interaction. Methods: We delivered different dose combinations of amylin and leptin to the VTA of male rats and measured subsequent food intake. We also measured feeding and body weight gain in response to VTA leptin after VTA amylin receptor blockade. Results: Low doses of intra-VTA amylin (0.04μg) and leptin (0.1μg) that alone had no effect on 24h chow intake, suppressed food intake when co-administered. Similarly, moderately suprathreshold doses of amylin (0.4μg) and leptin (0.3μg) delivered to the VTA reduced feeding individually, while the combination of these doses further suppressed food intake compared to either drug alone. Meal pattern analyses suggest that these effects may be mediated by reductions in meal size. Further evidence supporting the VTA as a physiologically relevant site of interaction for amylin and leptin signaling was provided by the finding that VTA amylin receptor blockade with AC187 (0.3μg) attenuated the anorectic and body weight-suppressive effects of intra-VTA leptin (0.6μg). Conclusions: These findings highlight the VTA as an important CNS structure mediating the cooperative effects of leptin and amylin.
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How Plant-Based Do We Need to Be to Achieve Weight Loss? Results of the New Dietary Interventions to Enhance the Treatments for Weight Loss (New DiETs) Study
Brie Turner-McGrievy, Ellen Wingard, Charis Davidson, Morgan Taylor, Sara Wilcox, Columbia, SC

Background: Several epidemiological studies have examined differences in health-related outcomes by dietary pattern (vegetarian, vegan, pesco, pesco-vegetarian, pesco-vegetarian, semi, or omnivorous (omni) diets), finding vegans have the lowest BMIs, prevalence of Type 2 diabetes, and risk of certain cancers. Vegans also gain significantly less weight as they age as compared to the other dietary patterns. No randomized trials have explored the effects of adopting these dietary patterns on weight loss. Methods: We conducted an 8-wk pilot weight loss trial among overweight and obese adults (n=63; 21% black, 27% male). Participants were randomized to follow one of the 5 dietary approaches, all emphasizing low-fat and low-glycemic index foods without caloric restriction, and attended weekly meetings to learn about their diet. Results: Using an intention-to-treat analysis, mean % weight loss (±SD) was significantly different among the 5 groups (vegan: -4.8±2.1%, veg: -4.8±3.2%, pesco: -4.3±1.8%, semi: -3.7±2.3%, omni: -2.2±0.0%; F=2.62, p<0.05). Post-hoc analysis revealed a trend towards a difference between the vegan and omnivorous groups (p=0.054). All macronutrients (% kcal) were significantly different (ANOVA, p<0.05) among the five groups with the vegan group having a greater decrease in saturated fat than other groups. Study participants will complete a 6-mo follow-up assessment to determine longer-term adherence, and those findings will also be presented. Conclusions: Plant-based eating styles have public health appeal, promoting both significant weight loss and dietary improvements. Compared to standard weight loss approaches, which focus on reducing energy intake, plant-based dietary approaches do not require dietary self-monitoring, which can be burdensome. Plant-based diets are a promising strategy for weight loss independent of caloric restriction.

Skeletal Muscle Mitochondrial Respiration Is Lower in African American Compared to Caucasian Women and Is Associated with Resting Metabolic Rate and Cardiorespiratory Fitness
James P. Delany, Giovanna Distelanova, Paul M. Coen, Frederico G.S. Toledo, John J. Dubé, Maja Stefanovic-Racic, Bret H. Goodpaster, Pittsburgh, PA

Background: The prevalence of obesity is greater in African American women (AAW) compared to Caucasian women (CW). Lower energy expenditure, particularly lower resting metabolic rate (RMR) is observed in AAW. This low RMR may play a role in the greater obesity in AAW, but reasons for this difference are not known. Methods: We examined skeletal muscle mitochondrial respiration, cardiorespiratory fitness (VO2 peak), and RMR in young (23.8±4.8 y) healthy women. We present data from 20 AAW (22.7±4.0 kg/m2, 62±9 kg) and 22 CW (22.7±3.1 kg/m2; 63±9 kg) matched for BMI and weight. Percutaneous biopsies of the vastus lateralis were obtained following an overnight fast. Mitochondrial respiratory properties were determined in permeabilized muscle fiber bundles by high-resolution respirometry. RMR was measured by indirect calorimetry, and VO2 peak was determined during a graded anaerobic test. Results: Basal (State 4; 67±6 vs. 82±18 pmol O2/sec/mg; p<0.015), maximal coupled (State 3; 320±68 vs. 422±65 pmol O2/sec/mg; p<0.001) and uncoupled (State U; 554±76 vs. 483±69 pmol O2/sec/mg; p<0.001) respiration were lower in AAW compared to CW. This corresponded with lower RMR (1259±183 vs. 1383±178 kcal/day; p<0.01) and VO2 peak (2007±428 vs. 2230±491 ml/min; p<0.03) in AAW. When combining groups, State 4, State 3 and State U respiration correlated positively with RMR (r=0.44, p<0.01; r=0.39, p<0.03; r=0.40, p<0.02) and VO2 peak (r=0.54, p<0.001; r=0.48, p<0.002; r=0.48, p<0.003). Conclusions: In summary, RMR and VO2 peak were lower in these young, lean AAW compared with matched CW. Skeletal muscle mitochondrial respiration was also lower in AAW and was associated with RMR and VO2 peak. These data suggest that differences in skeletal muscle mitochondrial respiration are related to the lower metabolic rate in AAW and may be related to the increased risk of weight gain in AA women.

Increased Muscle Mitochondrial Respiration in Obese Diet Sensitive Compared to Obese Diet Resistant Humans
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Background: Differences in skeletal muscle oxidative capacity and mitochondrial function may contribute to weight loss variability in humans. We previously showed that obese diet sensitive (ODS) have a higher proportion of oxidative fibers and mitochondrial proton leak in quadriceps muscle compared to obese diet resistant (ODR) women. It was hypothesized that skeletal muscle from ODS would demonstrate higher rates of mitochondrial respiration prior to and following a high fat meal (HFM). Methods: Diet adherent women who completed the Ottawa Hospital Weight Management Program (OHWMP) and demonstrated the highest (ODS) and the lowest (ODR) rates of weight loss participated in this study. V. lateralis biopsies were obtained from ODS (n=8; 52±2yrs; 95.8±1.8 kg, 36.3±1.7 kg/m2) and ODR (n=6; 46±2yrs; 101.5±8.9kg; 36.8±2.7kg/m2) before and 6 h post a HFM. The HFM was 35% of total daily caloric requirements with 60% of calories from fat (50% saturated fat). Mitochondrial metabolism was assessed in permeabilized muscle fibers with high resolution respirometry. Results: Fatty acid supported respiration (1.5mM malate (M), 200 mM octanoyl carnitine (OC), 5mM ADP) was significantly increased in ODS compared to ODR prior to (ODR vs. ODS; 8.6 ± 1.3 vs. 11.4 ± 1.6 pmol/s/mg wet wt, p<0.05) and 6 h post (ODR. vs. ODS; 12.1 ± 2.7 vs. 18.4 ± 2.5 pmol/s/mg wet wt, p<0.05) the HFM. OXPHOS (M, OC, 2mM pyruvate, 10mM glutamate, 10mM succinate, 10mM ADP) was also significantly increased in ODS compared to ODR prior to (ODR vs. ODS; 52.8 ± 1.4 vs. 65.2 ± 5.0 pmol/s/mg wet wt) and 6 h post (ODR vs. ODS; 53.4 ± 5.6 vs. 71.8 ± 6.1 pmol/s/mg wet wt) a HFM. Conclusions: This research demonstrates that muscle mitochondrial function is different between ODS and ODR. Future research will further investigate links between mitochondrial function, oxidative stress and weight loss.
T-57-OR

Exercise Resistance in Obese Individuals with Type 2 Diabetes

Lauren M. Sparks, Hui Xie Orlando, FL; Neil M. Johannsen, Timothy Church Baton Rouge, LA; Steven R. Smith Orlando, FL

Background: Exercise benefits most, but not all, individuals. We found that 9 months of supervised exercise failed to improve muscle metabolism in ~20% of a cohort of obese individuals with type 2 diabetes (T2D). Existing new evidence indicates that some individuals with insulin resistance have impaired early gene responses to acute exercise. We hypothesized that those individuals with T2D who did not metabolically improve after exercise have a transcriptional signature of their skeletal muscle distinct from those who did respond favorably. Methods: Forty-two individuals (37.5 ± 7.6 y; 34.8 ± 5.7 kg/m2) with T2D [and balanced in age, BMI, sex] were randomized to 9 months of supervised exercise. All participants underwent a DXA scan, blood draw and biopsy of v. lateralis before and after intervention. Mitochondrial DNA (mtDNA) copy number was assessed by qPCR. RNA was isolated from baseline muscle tissue for Illumina transcriptome analyses. Results: A ‘re- sponder’ was defined as: 1) decrease in HbA1c, 2) increase in muscle tissue for Illumina transcriptome analyses. Conclusions: Our data suggest that SLN/SERCA pump activity is an important mediator of muscle thermogenesis, metabolism and whole-body energy homeostasis. Therefore, SLN could serve as a potential target to enhance energy expenditure and treat metabolic-overload-induced obesity.

Background: Some individuals with insulin resistance have impaired early gene responses to acute exercise. We hypothesized that those individuals with T2D who did not metabolically improve after exercise have a transcriptional signature of their skeletal muscle distinct from those who did respond favorably. Methods: Forty-two individuals (37.5 ± 7.6 y; 34.8 ± 5.7 kg/m2) with T2D [and balanced in age, BMI, sex] were randomized to 9 months of supervised exercise. All participants underwent a DXA scan, blood draw and biopsy of v. lateralis before and after intervention. Mitochondrial DNA (mtDNA) copy number was assessed by qPCR. RNA was isolated from baseline muscle tissue for Illumina transcriptome analyses. Results: A ‘responder’ was defined as: 1) decrease in HbA1c, 2) increase in muscle tissue for Illumina transcriptome analyses. Conclusions: Our data suggest that SLN/SERCA pump activity is an important mediator of muscle thermogenesis, metabolism and whole-body energy homeostasis. Therefore, SLN could serve as a potential target to enhance energy expenditure and treat metabolic-overload-induced obesity.

T-58-OR

CB1 Antagonist Increased Irisin and Genes Related to Energy Expenditure in Fat-Fed Dog

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Background: The expression of genes related to energy expenditure, especially in muscle, the novel hormone secreted by muscle and fat has not been evaluated with CB1 antagonist rimonabant (RIM). We demonstrated in the dog that RIM improves deleterious effects of high fat diet (HFD) by reducing body fat, and increasing insulin sensitivity. The current study examines the longitudinal effects of HFD and RIM on irisin, uncoupling protein 1, 2, 3 (UCP1,2,3) and PPARy coactivator 1 alpha (PGC1-α) in muscle, fat, and liver. Methods: Animals were fed a HFD (52% fat) for 6 weeks followed by an additional 16 weeks of fat feeding with either HFD + placebo (PL) (n=9) or HFD + RIM (1.25 mg/kg per day; n=11). Biopsies from muscle, subcuta- neous (SC) and visceral (VIS) fat and liver were obtained for gene expression by qPCR and measured by FCR and RQ. Results: Irisin expression increased in muscle by 50% (P<0.05) and in SC fat by 56% (P<0.05) by HFD, RIM restored irisin expression in muscle and increased the expression of this gene 3 fold in SC and VIS fat (P<0.05). The same trend was observed for PGC1-α and UCP1 in the VIS and SC fat depots. Interest- ingly, UCP2 and UCP3 expression decreased by 85% and 65% (P<0.05) after 22 weeks of HFD in PL group, but was completely restored to pre-fat levels by RIM. Conclusions: Thus, irisin and genes related to energy expenditure increased significantly by CB1 antagonist.

T-59-OR

Sarcolin Is the Novel Regulator of Thermogenesis and Protects Against Obesity by Increasing Energy Expenditure

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Background: Skeletal muscle, which constitutes 40% of total body mass is considered to be important for heat generation and whole-body energy me- tabolism. However, the detailed mechanisms are not well defined. Methods: We surgically ablated intrascapular brown adipose tissue (iBAT) in a set of wild-type (WT) and SLN knockout mice (Sln−/−). Acute cold exposure of mice to 4 °C, and measurement of oxygen consumption, was performed in the CLAMS (Columbus Instruments Inc, Columbus, OH) set up, which is temperature controlled. Sln−/− mice were bred with SLN-overexpression mice (Sln−/−OE mice). For weight gain and obesity studies, WT, Sln−/−, and Sln−/−OE mice were fed with high fat diet (HFD, 45% calories from fat) for 12 weeks. Results: Here, we show that sar- colpin (SLN), a newly identified regulator of the sarco/endoplasmic reticu- lum Ca2+-ATPase (Serca) pump, plays critical role in the maintenance of body temperature and whole-body energy homeostasis. Mice, lacking SLN, (Sln−/−) were unable to maintain their core body temperature (37 °C), when challenged with acute cold (4 °C). Surgical ablation of iBAT and functional knockdown of uncoupling protein (UCP1) allowed us to highlight the role of SLN in thermogenesis. Reintroduction of SLN in the Sln−/− mice fully corrected the defective muscle-based thermogenesis. In addition, we show that Sln−/− mice are susceptible to weight gain and developed massive obesity when fed with HFD. In contrast, mice overexpressing SLN are resistant to HFD-induced obesity, implicating SLN as a regulator of muscle metabolism. Conclusions: Our data suggest that SLN/SERCA pump activity is an important mediator of muscle thermogenesis, metabolism and whole-body energy homeostasis. Therefore, SLN could serve as a potential target to enhance energy expenditure and treat metabolic-overload-induced obesity.

T-60-OR

Activation of Intestinal Taste Receptors Altered GLP-1 and PYY in Healthy Humans

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Background: Whether activation of enteroendocrine cell taste receptors (TR) leads to gut hormone release is controversial. Previous studies only examined the effects of sweet gustans in the fasting state, or did not consider the confounding effects of activating lingual and stomach TRs. Methods: We tested whether activation of sweet, and to a lesser extent umami and bitter TR activation in the intestine could modulate plasma levels of anorexiant hor- mones GLP-1 and PYY in humans. We made tablets (LC001) combining 1600 mg of sweet (sucrose, stevia, rebaudioside A), 200 mg of umami (glu- tamine) and 8 mg of bitter (quinone). The tablets were enterically coated to release at pH ≥5.5, thus eliminating taste and exposure in the stomach. 12 healthy subjects (7 males, mean age 50 y, fasting glucose 90 mg/dL, and BMI 29.5 kg/m2) were studied under 3 meal conditions in a blinded, randomized crossover design. Following a 12 h fast, LC001 or placebo was administered orally 60 minutes prior to: an extended fast (6 hours); 75 g oral glucose (OG); or 273 ml, Ensure Plus (EP). Results: LC001 had no effect on fasting or post-EP GLP-1 and PYY concentrations. In contrast, LC001 increased post OG GLP-1 and PYY concentrations relative to the pre-meal values: AUC0−5h 38% and 23%; Cmax 60% and 26%, respectively, p<0.05 for all LC001 also led to a 6% reduction in glucose AUC0−5h (p<0.05) with no change in concurrent insulin concentrations. Conclusions: Gut TR activation did not modulate gut hormone release in the absence of calorie intake. LC001 increased GLP-1 and PYY following OG but not EP. Because LC001 was composed predominantly of sweet gustans, the data suggest that activation of sweet TR requires a critical amount of the cognate fuel (carbohydrate) to modulate hormone release. TR activation beyond the stomach could have beneficial effects on body weight and glucose tolerance.

T-61-OR

Effects of PYY3-36 and GLP-1 on Energy Intake, Energy Expenditure and Appetite in Overweight Men

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Background: Aim: To examine the effects of GLP-1 and PYY3-36, sepa- rately and in combination, on energy intake, energy expenditure, appetite sensations, glucose and fat metabolism, ghrelin and vital signs in overweight men. Methods: 25 male subjects participated in this randomized, double-blind, placebo-controlled 4-arm, crossover study. On a separate test days they received a 150 min intravenous infusion of either a) 0.9 pmol/kg/min PYY3-
36, b) 1.0 pmol/kg/min GLP-1, c) 0.8pmol/kg/min PYY3-36 + 1.0pmol/kg/min GLP-1 or d) placebo. Ad libitum energy intake was assessed during the final 30 min. Measurements of subjective appetite sensations, energy expenditure and fat oxidation, vital signs and blood variables were collected throughout the infusion period. Results: No effect on energy intake, was found by mononusions of PYY3-36 (45%) or GLP-1 (3%). However, the combined infusion reduced energy intake compared to placebo (30%) and was more than the sum of the mononusions, demonstrating a synergistic effect. Combined infusion slightly increased sensation of nausea, but this effect could not explain the effect on energy intake. A decrease in plasma ghrelin was found after all active treatments compared to placebo (P<0.05); however, infusions of GLP-1+PYY3-36 resulted in a significant decrease compared to the mononusions Conclusions: Co-infusion of GLP-1 and PYY3-36 exerted a synergistic effect on energy intake. The satiating effect of the meal was enhanced by GLP-1 and PYY3-36 in combination compared to placebo. Co-infusion was accompanied by slightly increased nausea and a decrease in plasma ghrelin, but neither of these factors could explain the reduction in energy intake

T-62-OR
Baseline Slow Wave Sleep Negatively Relates to Weight Gain and Increased Caloric Intake During Sleep Restriction in Healthy Adults
Andrea M. Spathon, Nannin Goel, David F. Dinges Philadelphia, PA
Background: We have recently shown that sleep restriction (SR) leads to increased caloric intake and weight gain. However, all subjects who responded to SR to the same degree (some gain a significant amount of weight while others maintain or lose weight). The amount of time spent in sleep stages 3 or 4 (slow-wave sleep [SWS]) is stable and trait-like within individuals but highly variable between individuals. The current study examined if individual differences in baseline SWS associated with energy balance responses to SR. Methods: N=31 healthy subjects (33.6±8.4 y, 25.6±2.8 BMI, 15 f) participated in a laboratory protocol including 2 baseline nights (BL1-2; 10-12h time in bed [TIB]/night) followed by 5 consecutive SR nights (4h TIB/night). Polysomnography was recorded on BL2 and scored using standard criteria. Duration of each sleep stage was calculated as a percent of total sleep time (%TST). Results: Sleep efficiency and rapid eye movement sleep were not related to weight gain or SWS caloric intake (ps=0.29). Stage 2 %TST was not significantly related to weight gain (r=0.31, p=0.11) but was positively associated with increased caloric intake during sleep restriction. [NICH N0R004281, F31 AG044102, CTRC UL1RR024134, ONR N0001411-1-0361]

T-63-OR
Role of Child Weight Status and the Relative Reinforcing Value of Food in Children’s Response to Portion Size Increases
Tanja V. Kral, Adrienne Remiker Philadelphia, PA; Erin M. Rauh Fort Collins, CO; Renee H. Moore Raleigh, NC
Background: The portion size (PS) of food has been identified as an important determinant of energy intake in children. It remains to be established if children’s susceptibility to overeating when served large food portions may depend on their weight status or how reinforcing they find food to be. The aim of this study was to compare the effects of increasing the PS of all foods and beverages served at a fast-food style meal on energy intake in normal-weight (NW) and obese (OB) 8- to 10-year-old children and to test if children’s response to PS increases was affected by their relative reinforcing value of food (RRVF). Methods: In a cross-over design, 50 children (25 NW, 25 OB) were served dinner once a week for 3 weeks. Across conditions, the same dinner was served, but the PS of all foods and the sugar-sweetened beverage varied (100%, 150%, 200%). Children’s RRVF was assessed using a computerized behavioral choice task. Results: There was a significant main effect of PS (P=0.003) and child weight status (P=0.0005) and a non-significant trend for a PS-by-weight status interaction (P=0.108) on energy intake. Mean intakes across conditions (100%, 150%, 200%) were 801 ± 57, 964 ± 58, and 873 ± 57 kcal for NW children and 1041 ± 57, 1129 ± 57, and 1210 ± 57 for OB children, respectively. Neither the main effect of children’s RRVF status (high/low) nor the PS-by-RRVF status interaction was significant (P>0.48). Conclusions: Obesogenic food environments that offer large portions of energy-dense foods affect all children’s energy intake irrespective of their weight status or how reinforcing they find food to be.

T-64-OR
Targeted Prevention of Excess Weight Gain and Eating Disorders in High-Risk Adolescent Girls with Loss of Control (LOC) Eating: A Randomized, Controlled Trial
Marian Tanoisky-Kraff Bethesda, MD; Lauren B. Shomaker Ft. Collins, CO; Denise E. Wilfley St. Louis, MO; Jamie Young New Brunswick, NJ; Tracy Shrocco, Mark Stephans, Lisa Ranzenhofer, Camden Elliott, Sheila M. Brady, Rachel Miller, Anna Vannucci, Edny J. Bryant, Robyn Osborn, Sarah Berger, Cara Olsen, Merel Kozlosky, James C. Reynolds, Jack A. Yanovski Bethesda, MD
Background: LOC eating, which comprises both objective and subjective binge eating episodes, predicts excess weight gain and exacerbated disordered eating in youth. Interpersonal psychotherapy (IPT) reduces binge eating and induces weight stabilization in obese adults with binge eating disorder (BED). It is unknown whether IPT prevents excess weight gain and eating disorder (ED) onset in at-risk youth. Methods: We randomized 113 girls (12-17y) with BMI 75th-97th% (high and lower risk of ED episodes/month) to a 12-wk group of IPT for the prevention of weight gain (IPT-WG; n=55) or health education (HE; n=58) to examine program efficacy for preventing excess weight gain and EDs over a 1-y follow-up interval. Analyses accounted for age and race. Results: Girls attended more IPT-WG than HE sessions (85 vs. 78%, p=0.05). Retention through 1-y follow-up was 96% for IPT-WG and 85% for HE (p=0.47). Groups did not differ in percentage that gained more than expected BMI at 1-y follow-up (IPT-WG 30 vs. HE 41%, p=0.26). Despite similar percentages of non-overweight (IPT-WG 4 vs. HE 3%) and overweight (IPT-WG 49 vs. HE 52%) at baseline (p=0.96), 0% of girls in IPT-WG compared to 10% in HE increased their weight status and became overweight or obese by 1-y (p=0.02). About half of girls in each group ceased LOC eating by 1-y (IPT-WG 51 vs. HE 48%, p=0.76), but fewer girls in IPT-WG reported objective binge eating at 1-y (4 vs. 17%, p=0.04) despite no difference in baseline episodes. Girls in IPT-WG were 2.6 times less likely to have a partial/full-syndrome ED during the 1-y follow-up than girls in HE (p=0.07). Conclusions: A specialized IPT program designed to reduce excess weight gain in high-risk adolescent girls by targeting LOC eating, relative to usual care, reduces classic binge eating patterns that characterize BED and the development of overweight/obesity in at-risk girls.

T-65-OR
Changes in Taste Perception and Eating Behavior After Bariatric Surgery-Induced Weight Loss in Women
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Background: Roux-en-Y gastric bypass (RYGB) surgery causes greater weight loss than laparoscopic adjustable gastric banding (LAGB). The mechanism responsible for this difference is not known, but could be related to changes in taste perception, which would influence eating behavior. We tested the hypothesis that RYGB has weight loss-independent and diet-dependent effects on sweet taste perception and eating behavior in obese people. Methods: A total of 27 obese subjects were studied before and after 20% weight loss induced by RYGB (n=17, BMI=46±8 kg/m2) or LAGB (n=10, BMI=49±11 kg/m2). After surgery, all subjects participated in a supervised weight management program to enhance consumption of a similar energy-deficit diet and achieve the target weight loss within 4-6 months. The following outcomes were evaluated: 1) taste sensitivity (at threshold and above-threshold sucrose and glucose concentrations); 2) sucrose preferences; 3) sweetness palatability; and 4) eating behavior. Results: Weight loss induced by both procedures caused the same decrease in: 1) preferred concentration of sucrose (±2.10%); 2) perceived sweetness of sucrose (±7.5%); 3) frequency of cravings for sweets (±22.5%); and 4) influence of emotions (±27±5%) and external food cues (±30±4%) on eating behavior (all P-values
<0.05). Neither RYGB nor LAGB affected taste detection thresholds. RYGB, but not LAGB, shifted sweetness palatability from pleasant to unpleasant when repetitively tasting sucrose (P = 0.05). **Conclusions:** Both LAGB and RYGB are associated with similar alterations in eating behaviors, when weight loss is matched. These changes in eating behavior are not associated with changes in taste sensitivity, suggesting other, as yet unknown, mechanisms are involved.

**1:30 PM – 3:00 PM**

**Oral Abstracts Track 3 • Surgery**

**T-66-OR**

**Gastric Bypass Surgery vs. Highly Intensive Lifestyle and Medical Intervention to Manage Type 2 Diabetes: The CROSSROADS Randomized Clinical Trial**

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**Background:** Randomized trials of bariatric surgery vs lifestyle/medicines likely differ highly due to differences in subjects, limiting generalizability of findings. We addressed this problem while comparing Roux-en-Y gastric bypass (RYGB) to the most rigorous lifestyle-medical intervention for type 2 diabetics yet studied in such an RCT. **Methods:** Using a population-based, Shared Decision Making recruitment strategy, we screened 1808 adults with T2DM and BMI 30-45 kg/m2. Of these, 43 were randomized to RYGB or a highly intensive lifestyle & medical intervention (ILMI) involving ≥45 min of aerobic exercise, 5 d/wk for 1 yr, largely supervised by exercise physiologists in a research gym. Using frequent in-person contact, nutritionists directed a weight- and glucose-lowering diet, with daily nutrition & exercise logs. Optimal T2DM medical treatment was provided. **Results:** The groups were equivalent at baseline for age, gender, ethnicity, anthropometrics, fitness, glycemia, dyslipidemia, and hypertension. However, the RYGB group had longer T2DM duration (11.4±4.8 vs 6.8±5.2 yr, P<0.009). Weight loss at 1 yr was 25.8±14.5 vs 6.4±5.8% after RYGB vs ILMI, respectively (P<0.001). The ILMI exercise program was successful, yielding a 30.1±16.9% increase in VO2max, but an even greater 46.3±16.7% increase followed RYGB (P=0.005). Diabetes remission (HbA1c<6.0% off diabetes medicines) at 1 yr was 60% with RYGB vs 6% with ILMI (P<0.002), even though surgical patients had longer T2DM duration. HbA1c decline over 1 yr was only modestly more after RYGB than ILMI (from 7.7 ±3.0 to 6.4±1.6% vs 7.3±3.0 to 6.9±1.3%, respectively, P=0.04). However, this drop occurred with fewer medications after RYGB. No life-threatening complications occurred. **Conclusions:** Compared to the most rigorous ILMI yet tested vs surgery in an RCT, RYGB yielded greater T2DM remission in mild-moderately obese patients.

**T-67-OR**

**A Randomized Trial to Compare Surgical and Medical Treatments for Type 2 Diabetes: The Triad Study**

Anna P. Courcoulas, Brett H. Goodpaster, Jessie K. Eagleton Pittsburgh, PA; Wei Lang Winston-Salem, NC; Melissa A. Kalarchan, Frederico G. Toledo, Steven Beller, John M. Jakicic Pittsburgh, PA

**Background:** Determine feasibility of a randomized controlled trial (RCT) and compare initial outcomes of gastric bypass, gastric banding, and a structured weight loss program for treating type 2 diabetes mellitus (T2DM) in grade 1 and 2 obese participants. **Methods:** A 3-arm RCT with 69 participants. RYGB, BMI 30-40 kg/m2, T2DM; Convert 30-40 RYGB, T2DM, using Roux-en-Y gastric bypass (RYGB), laparoscopic adjustable gastric band (LAGB), or an intensive lifestyle weight loss intervention (LWLI). Primary outcomes on the intention to treat (ITT) cohort were feasibility and effectiveness measured by weight loss and improvements in glycemic control. **Results:** 667 potential participants were screened of whom 69 (10.3%) were randomized, 30 (43.5%) with grade 1 obesity. Mean age was 47.3±6.4 years, 81% were women, and mean glycated hemoglobin was 7.9±2.0. After randomization, 7 (10%) participants refused to undergo their allocated intervention (3 RYGB, 1 LAGB, 3 LWLI) and 1 RYGB was excluded for current smoking. Twenty subjects underwent RYGB, 21 LAGB, and 20 LWLI with retention at 12 months of 90%, 86%, and 70%, respectively. RYGB participants had the greatest weight loss compared to LAGB and LWLI with average weight loss of 27%, 17%, 10% from baseline, respectively (P<0.001). Partial/complete remission of diabetes was 50%/17% in RYGB, 27%/23% in LAGB and 0%/0% in LWLI (P<0.005/0.047, partial/complete). **Conclusions:** Preliminary results show that RYGB was the most effective treatment followed by LAGB for both weight loss and diabetes outcomes at one year. This study also highlights several potential challenges to successfully completing a larger RCT for diabetes and obesity treatment in those with BMI 30-40 kg/m2, including the difficulties associated with recruiting and randomizing patients to surgical versus non-surgical interventions.

**T-68-OR**

**Baseline Insulin Levels Predict the Effects of Bariatric Surgery on Serious Events Over 20 Years in the Swedish Obese Subjects Study**

Lars Sjöström, Lena M. Carlsson, Markku Peltonen Gothenburg, Sweden

**Background:** Bariatric surgery improves survival and reduces the incidence of myocardial infarction, stroke and cancer in obese patients. However, to identify clinically useful predictors of the treatment benefit, the total effect on all serious events needs to be considered. The long-term effects of bariatric surgery on a composite endpoint, consisting of CV events, cancer and mortality of any cause, was therefore examined in the non-randomized prospective controlled Swedish Obese Subjects (SOS) study. **Methods:** The effect of bariatric surgery on the time to the first serious event (death, myocardial infarction, stroke or cancer) was analyzed in 2010 obese subjects who underwent gastric bypass (13%), banding (19%) or vertical banded gastroplasty (68%), and 2037 contemporaneously matched obese controls receiving usual care. Age was 37-60 years and BMI was ≥34 kg/m2 in men and ≥38 kg/m2 in women. Follow-up time was up to 20 years. **Results:** During follow up, 518 controls and 453 surgery patients had at least one serious event. Bariatric surgery reduced the incidence of serious events (HR=0.84, 95% CI, 0.74 to 0.96, p=0.007). The effect of surgery was greater in subjects with high baseline insulin levels compared to patients with low insulin (HR=0.76, 95% CI, 0.64-0.89 and HR=0.85, 95% CI, 0.69-1.04, respectively, interaction-p-value=0.005). Baseline BMI did not influence the treatment benefit (interaction-p-value=0.499). **Conclusions:** Bariatric surgery reduces the incidence of serious events in obese patients. The treatment benefit is increased in patients with high baseline insulin levels, while the degree of obesity does influence the effect of surgery.

**T-69-OR**

**Association of Gastric Bypass on Gestational Weight of Children Born Before and Following Gastric Bypass Surgery**

Ted D. Adams, Ahmad O. Hammoud, Lance E. Davidson, Alison M. Fraser, Rodrick McKinlay, Steven C. Simper, Sherman Smith, Ken R. Smith, Steven C. Hunt Salt Lake City, UT

**Background:** Interaction between maternal obesity, intrauterine environment, and adverse clinical outcomes of newborns has been described. This retrospective, matched control cohort study explored the birth weights of paired offspring of women before and after gastric bypass (GBP) surgery that were also compared to birth weights of paired offspring of matched obese control women without bariatric surgery. **Methods:** Using birth certificate data, 237 women who had given birth to a child before and after GBP surgery were matched to 237 women without GBP surgery and with at least 2 live births. Women were individually matched by age, race, parity, birth years of the child born just prior to and the child born just following GBP surgery, and mother’s BMI group (30-34.9; 35-39.9 and ≥ 40 kg/m2). Using repeated-measures ANOVA, the birth weights were compared between children born to women of each group at the two deliveries. Differences in birth weights (pre-minus post-surgery deliveries in the same mother) were also compared. **Results:** Birth weights at pre-surgery delivery were 3533g and 3562g for GBP and non-GBP, respectively (P=0.49) and at post-surgery delivery 3164g and 3412g (P=0.001) for GBP and non-GBP, respectively. Declines in birth weight from the pre- to post-surgery deliveries were 369g and 150g for GBP and non-GBP mothers, respectively (P=0.001). The decrease in birth weight from pre- to post-surgery deliveries in the GBP group represented a 7.3% lower birth weight than controls at post-surgery delivery. **Conclusions:** Birth weight of children born to mothers after GBP was significantly lower when compared to birth weight of siblings born before GBP and also to birth weight of the 2nd child born to non-GBP mothers. Biological reasons for as well as clinical relevance of these findings are yet to be determined.
T-70-OR

Does Gastric Bypass Influence Aging?
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Stanford, CA

Background: Telomeres are a well-known marker of aging. Current evidence suggests a link between aging, obesity and inflammation. In this longitudinal study, our goal is to show the relationship between telomere length (TL) and surgical weight loss. Methods: Preop and 3, 6, and 12 month postop telomere length, demographic and serologic data were prospectively collected on 51 bariatric surgery patients. Telomere length was assayed with quantitative PCR for a T/S ratio which is proportional to mean telomere length. Data were compared using Students t-tests and regression analyses. Results: Average preop demographics were: age 48.6, BMI 44.3, % female (76.5). By 12 mos postop, percent excess weight loss was 71% and declines were seen for hs-CRP (8.3 to 3.6) and fasting insulin (24 to 6). Telomere length (shorter is associated with aging) for the entire cohort did not change significantly (0.9867 to 0.9822). However, when stratifying by preop CRP and LDL, significant changes were seen. Postop, high LDL patients had significant telomere lengthening in comparison to low LDL patients: -0.0271 (low LDL) vs. +0.0227 (high LDL), p=0.0387. Postop, high CRP patients had significant telomere lengthening in comparison to low CRP patients: -0.0294 (low CRP) vs. +0.04125 (high CRP), p=0.005. In the high CRP group, there was a significant positive correlation between weight loss and telomere length (r=0.8787, p=.0498). In the high baseline CRP group, postop HDL increase was correlated with increase in telomere length, r=0.842, p=0.0176. Conclusions: This is the first study to demonstrate surgical weight loss leading to decreased aging by increasing telomere length. Patients with high preoperative CRP and LDL sustained the greatest increases in telomere length. In addition to weight loss, HDL increase was significantly and positively correlated with telomere length increase.

T-71-OR

Bariatric Surgery & Gestational Diabetes: A Population-Based Study of 2199 Pregnancies
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Background: Many women of reproductive age undergo bariatric surgery. The objective of this study was to compare the risk of gestational diabetes in women with versus without bariatric surgery history. Methods: After excluding women with diabetes the year before pregnancy, we identified 1,231,419 singleton pregnancies in the Swedish Medical Birth Register between 1998 and 2010. To each post-surgery pregnancy (n=2199; 50% gastric bypass, 19% gastric banding, 29% vertical-banded gastroplasty, 3% other), 5 control pregnancies were matched by age, early pregnancy BMI, parity, smoking, education, and delivery year. To compare women with bariatric surgery history with women eligible for bariatric surgery, a secondary control cohort was sampled from women with a BMI ≥35 and matched with the same factors except BMI. Gestational diabetes information was retrieved from the Medical Birth Register and the National Patient Register. Odds ratios (OR) were estimated conditioned on the matching factors. Results: Compared to all pregnancies without bariatric surgery history (n=1,229,220), post-surgery pregnancies showed higher maternal age, smoking prevalence and mean BMI, but lower education level and parity (all p<0.001). Lower risk for gestational diabetes was seen in post-surgery pregnancies than in matched control pregnancies (1.7% vs 3.6%; conditional OR 0.45; 95%CI 0.32-0.66; P<0.001). In the secondary analysis, comparing post-surgery pregnancies with matched control pregnancies in women with BMI ≥35 the difference increased (1.7% vs 6.0%; conditional OR 0.34; 95%CI 0.20-0.59; P<0.001). Conclusions: Women with bariatric surgery history had lower risk of gestational diabetes than matched controls, particularly compared to matched controls eligible for bariatric surgery.
Maternal Mental Health and Toddler Temperament Impact How Toddlers Are Fed: A Sample of Low-Income Mothers Participating in WIC

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Background: Maternal depression and anxiety have been shown to affect child well-being; depressed mothers tend to be less sensitive and more reactive to a negative or fussy child (i.e., less responsive parenting). However, little is known about how these factors impact dimensions of feeding (i.e., controlling feeding practices compared to creating a structured feeding environment which may be protective against excessive weight gain.). Methods: A cross-sectional study of 210 low-income WIC mothers with a toddler aged 12 to 36 months. Mothers completed the Toddlers Need Feeding Questionnaire to assess food to soothe, Early Child Behaviors Questionnaire (ECBQ-R) to measure toddler temperament, the Center for Epidemiological Studies Depression Scale (CES-D) and an author developed scale to assess dimensions of parental structure and control when feeding toddlers. Results: 42% of mothers were obese and 37% of toddler were overweight (BMI > 85th %). Clinical depression was identified in 28% of mothers. Mothers who reported exposing toddlers to a more structured feeding environment tended to perceive their toddlers to be less fussy (negative) and to have higher self-regulation (effortful control) scores. In contrast, use of food to soothe toddler distress was positively associated with the practice of using the TV/radio to soothe a crying/fussing toddler. Conclusions: The proportion of mothers who were clinically depressed was high among these WIC mothers and was associated with more controlling and less structured feeding practices. To encourage responsive feeding, interventions may need to be individually tailored to address maternal mental health and perceptions of toddler temperament.

Mom Feeds Us Differently: Differential Restrictive Feeding Is Associated with Differential BMI and Caloric Compensation among Male and Female Twins

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Background: Restrictive feeding by parents is linked to childhood overeating and obesity; however these could be spurious associations due to other factors that drive children to overeat and parents to restrict (e.g., child genetics, other home environmental factors). Using a pediatric twin design, we tested whether differences in restrictive feeding within families is associated with differences in twins' weight status and caloric compensation ability. Methods: Sixty-four same-sex twin pairs, ages 4-7 years old, were studied with their mothers. Feeding styles towards each twin were assessed by the Child Feeding Questionnaire (CFQ). Child caloric compensation ability (COMPX%) was assessed using an established laboratory preloading protocol. Child BMI was assessed by directly measured weight and height; waist circumference and %body fat (from DXA) were also assessed. Within each family, we calculated within-twin pair differences in CFQ feeding measures, COMPX%, anthropometric/body fat measures. Results: Within-pair differences in restriction were associated with within-pair differences in child COMPX% (r=-0.25, p<0.05) and BMI z-score (r=0.31, p<0.01). Specifically, mothers were more restrictive towards the more poorly compensating and heavier twin. Also, within-pair differences in parental pressure to eat were associated with differences in BMI z-score (r=-0.40, p<0.001), percent body fat (r=-0.38, p<0.05) and waist circumference (r=-0.37, p<0.05). Parents were more pressuring towards the thinner twin. Conclusions: Parents feed their children differently, even same-sex twins pairs, which could drive differences in adiposity. Future research needs to elucidate cause-and-effect, and intervention implications.

Maternal Work Hours Predict Girls' BMI from 5 to 15y, Even After Adjusting for Frequency of Food Eaten Away from Home and Daily Hassles

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Background: Maternal work hours is a hypothesized risk factor for childhood obesity. However, it is unclear whether work hours or other variables related to employment (e.g. increased daily hassles or food away from home) may explain this relation. Methods: In this study, 167 White, middle-income girls and their mothers were followed from 5-15y. Measures included girls' BMI and food eaten away from home (FAFH), mothers' work hours, BMI, and severity and frequency of daily hassles. Results: At 5y, 36% of mothers reported working full-time. Maternal work hours was positively associated with FAFH at 5y, but no relation was observed between work hours and frequency of daily hassles. In addition, maternal work hours was associated with an increased risk for girls' overweight (OR=1.03) at 5y, after adjusting for demographics. However, severity of daily hassles was found to be a greater risk factor for girls' overweight (OR=2.39) at 5y. No relation was observed for FAFH and girls' BMI at 5y. By 15y, 71% of mothers reported working full-time. Using growth curve analyses, a main effect for maternal work hours was observed on girls' BMI z-score from 5 to 15y, even after adjusting for daily hassles and FAFH, suggesting that working more hours outside the home was consistently associated with higher BMIs in girls. No main effect for daily hassles or FAFH was found on girls' change in BMI from 5y to 15y. Conclusions: This study suggests that the relation between maternal work hours and girls' weight status may be present in early childhood and persist into adolescence. Research exploring mediators of relations between work hours and child weight status is needed to identify possible childhood obesity prevention strategies. Our results expand upon previous findings by using 10y of longitudinal data and including contextual measures hypothesized to be associated with work hours.
Maternal Low Protein Diets Decrease Skeletal Muscle Growth, PGC-1alpha mRNA Expression and Mitochondrial Oxidative Respiration and Increase Obesity and Insulin Resistance in Obesity Prone Sprague-Dawley Rats

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Background: Malnutrition during the fetal growth period followed by postnatal catch-up growth results in obesity and the development of type 2 diabetes (T2D). Methods: To determine whether a prenatal low protein diet followed by postnatal high fat diet increase offspring’s propensity to obesity and T2D, obese-prone female Sprague-Dawley rats were fed 8% (low protein; LP) or 20% protein (normal protein; NP) diets 3 weeks prior to mating. Dams were fed the same diet during pregnancy and lactation. Postnatally, male offspring were fed 10% (normal fat, NF) or 45% (high fat, HF) diets for 12 weeks. Results: Maternal LP and postnatal HF diets resulted in offspring obesity and increased insulin resistance. Recent studies showed that reduction in peroxisome proliferator-activated receptor-gamma coactivator-1alpha (PGC-1a) increases T2D risk due to decreased mitochondria biogenesis and oxidative metabolic function. No studies have tested whether maternal LP and postnatal HF diets influence muscle PGC-1a expression, mitochondria biogenesis, and mitochondrial oxidative respiratory functions. Current data showed that skeletal muscle PGC-1a mRNA expression and mitochondrial oxygen consumption rate is decreased by maternal LP while postnatal HF diets had no effect. Mitochondria biogenesis, mRNA expression of mitochondrial biogenic factors including nuclear respiratory factor 1 (NRF1) and cytochrome c oxidase 1d (COX1 and 4) were unaffected by maternal LP and postnatal HF diets. Interestingly, skeletal muscle size was 12-17% smaller in the maternal LP group compared to NP group with corresponding decreases in insulin-like growth factor 1 and 2 (IGF-1 and 2) mRNA expression. Conclusions: Taken together these data suggest that maternal LP and postnatal HF diets increase risk for T2D by decreasing skeletal muscle growth, PGC-1a expression, and oxidative metabolic function.

T-80-OR
Gestational Stress and Obesity: Cortisol and Gonadal Steroids in the Maternal-Fetal Unit
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Background: Obesity and stress are associated with multiple risks to mother, fetus and child. Environmental stressors are common in our Caribbean Black population with high prevalence of obesity comorbidities. We found an inverse relationship between maternal BMI and placental 17-β (OH) steroid de-hydrogenase (HSD) activity, a regulator of maternal steroid passage to the fetus associated with impaired conversion of estradiol (E2) to estrone. To assess effects of gestational stress and obesity we studied 40 uncomplicated singleton births in unsellected mothers aged 17-45 with mean BMI ± SD = 35 ± 6 (range: 24-49) and 18% with gestational diabetes (GDM). Methods: Placental weight and HSD activities (by GC/MS/MS). Obstetric record analyses. Cord serum cortisol, E2, estrone, DHEA, 5-AD and insulin (by ELISA). Socio-environmental stress questionnaire. Results: Mean cord serum levels: cortisol, 40.0± 11.9 μg/dl; estradiol, 3180± 690 pg/mL; insulin 28.6 ± 6.74 μU/mL. Mean birthweights: 3110 ± 590 g (1710-4625) unrelated to maternal BMI, correlated strongly with cord cortisol (r= 0.65; p<0.0001). Maternal BMI, inversely related to gestational age (r=-0.49; p<0.0035), was unrelated to cord E2, DHEA and surprisingly insulin. Cord E2 and insulin levels were inversely correlated (r=-0.53, p=0.0014) mainly attributable to female sex but unrelated to GDM. E2 conversion was inversely related to BMI with 17-β HSD 2 activity inversely related to cord E2. Conclusions: Estriol is protective of pancreatic β-cell function which might explain the relative absence of hyperinsulinemia and macrosomia, whereas impaired placental steroid metabolism with reduced inactivation of estradiol and high cortisol levels may contribute to the dysmetabolic diathesis in offspring.

T-81-OR
Greater Physical Activity Levels During Pregnancy Are Associated with Lower Inflammation and Insulin Resistance in Obese Women
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Background: Compared to lean pregnant women, obese women develop greater insulin resistance and systemic inflammation during pregnancy. Identifying lifestyle factors that can reduce the metabolic effect of obesity during pregnancy is critical to protect both the mother and the fetus from insulin resistance and inflammation. Methods: We prospectively investigated the association between physical activity and serum levels of insulin, glucose and C-reactive protein (CRP) at gestation week 30 and birth in 33 lean and 18 obese women. Total body fat mass (FM) was obtained using air displacement plethysmography (BodPod®). Physical activity was monitored using an accelerometer (Actical®, Phillips, Andover, MA) worn for 2 weekend days and 2 week days to derive total daily activity counts (AC). Serum analyses were conducted using standard ELISA and colorimetric assays on fasted serum samples at gestation week 30 and on umbilical cord serum at birth. Results: Homeostatic model assessment of insulin resistance (HOMA-IR) indexes computed from insulin and glucose levels were negatively associated with AC in obese women at gestation week 30 (r=-0.58, P=0.01, N=18) and at birth (r=-0.542, P=0.07, N=13). Similarly, CRP levels were negatively associated with AC in obese women (r=-0.523, P=0.03) at gestation week 30. There were no significant associations of HOMA-IR indexes or CRP levels with AC in lean women. Conclusions: These data suggest that physical activity interventions during pregnancy may be beneficial to the mother and the offspring by increasing maternal and fetal insulin sensitivity and reducing maternal inflammation in obese pregnant women. Funded by USDA-ARS CRIS # 6251-51000-005-03S.
T-82-OR
Brain Activation in Stress-Responsive Regions Is Associated with Actual Food Intake in the Laboratory in Overweight Girls
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Background: Difficulties in social functioning and emotion regulation are commonly reported by overweight youth and are associated with reported episodes of dishibited eating. In theory, socially stressful situations lead to negative affective states, which in turn, trigger excessive food consumption. This theoretical mechanism can be elucidated by studying how actual food intake relates to activation of brain regions linked to social stress (e.g., amygdala) and emotion regulation (e.g., prefrontal cortical regions) that modulate the hypothalamic control of energy intake. Methods: Eighteen overweight (BMIz: 1.86 ± 0.41) adolescent (15.78 ± 1.59 y) girls underwent fMRI during a simulated virtual chatroom paradigm during which they were exposed to peer evaluation. Immediately after the fMRI session, girls consumed lunch ad libitum from a 10,934-kcal laboratory buffet test meal array with the instruction to “let yourself go and eat as much as you want.” Results: Girls’ greater relative activity in the right amygdala when contemplating feedback from peers they rejected (versus those they selected) was positively associated with total energy consumption (<p>.01). Further, girls’ activation in the ventromedial prefrontal cortex, anterior cingulate cortex, and hypothalamic areas when both anticipating and receiving peer feedback was inversely correlated with energy intake (<p=.005). Conclusions: In overweight girls, activation of brain regions involving social stress and emotion regulation appear to be linked to actual food intake. While amygdala activation was positively associated with energy consumption, findings suggest that failure to engage prefrontal regulatory regions may lead to overeating in order to cope with negative affect due to social stress. These data support the role of social-emotional neurological underpinnings for overeating in susceptible youth.

T-83-OR
The Effects of Energy Imbalance and Obesity Propensity on the Neuronal Response to Food Cues
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Background: The mechanisms responsible for the propensity to weight gain are poorly understood. How short-term energy imbalance impacts the neuronal response to food cues in obesity resistant (OR) or obesity prone (OP) individuals is also unclear. Methods: Here we report findings of a study designed to examine differences in neuronal response to visual food cues during energy imbalance in healthy adults recruited as either OR or OP based on self-identification, BMI, and personal/family weight history. 26 OR and 28 OP individuals were studied in underfed (UF) and overfed (OF) as compared to eu-caloric (EU) conditions in a randomized crossover design. Each study period included a 3 day run-in diet, 1 day of controlled feeding (basal energy needs for EU, 40% above/below basal energy needs for OF/UF), and a test day. On the test day fMRI was performed in the acute fed state (30 minutes after a test meal) while subjects viewed images of foods of high hedonic value and neutral non-food objects. Results: Overall UF was associated with significantly increased activation of inferior visual cortex. Most interestingly, UF was associated with significantly greater activation of the insula, inferior prefrontal cortex (PFC), somatosensory cortex and dorsolateral PFC in the OR as compared to OP. While OF was associated with reduced activation of inferior visual cortex overall, no group interaction was seen with OF. Conclusions: These findings suggest that individuals resistant to weight gain and obesity are more sensitive to short-term energy imbalance particularly with UF than those prone to weight gain. The inability to sense or adapt to changes in energy balance may represent an important mechanism contributing to excess energy intake and risk for obesity.
T-86-OR
CBT for Weight Loss Alters Network Connectivity in Obesity: A Resting State fMRI Pilot Study
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Background: Several studies have examined resting state network connectivity in obesity (Tregellas et al., 2011; Kullman et al., 2012; Garcia, 2012); however, none has tested differential effects of treatment. Methods: Participants were 12 obese (mean body mass index [BMI] = 35.9, SD= 3.3) adults (10 women; mean age= 40.3 years, SD 11.5) that completed a 12-week CBT group weight loss program. Participants completed an fMRI, eyes open, resting state task within 1 week before beginning CBT and 12 weeks post. Images were collected on a Siemens 3T Allegra scanner using a T2-weighted gradient single-shot echo sequence (TR/TE=2000/30msec; flip angle=90°; FOV=220 mm; matrix=64; slice thickness=5 mm). SPM8 was used for all preprocessing and data were analyzed using the GIFT independent component toolbox to identify components reflecting distributed networks (Laird et al., 2011) to examine activation change across time. Results were significant at p<0.05, uncorrected.

Results: Functional connectivity strength differed before and after CBT. Prior to treatment, participants showed more connectivity strength in the medial prefrontal cortex of the default mode network (DMN), BA24 of the ACC-OFC network, and the Rolandic operculum and insula of the insula-frontal operculum network. After treatment, connectivity within networks showed increased strength in BA32, BA39, BA21, IFG/BA46, superior parietal regions, and middle temporal gyrus. Conclusions: Results indicate obese individuals showed increased connectivity in networks responsible for emotion processing, gustation, and reward encoding. After weight loss, there was greater connectivity in regions responsible for inhibitory control, cognitive reasoning and preference for delayed discounting. Collectively, findings suggest that weight loss CBT alters resting state network connectivity previously obesity.

T-87-OR
Differences in Cortical Thickness and Striatal Volume Associated with Increased Body Mass Index and Waist Circumference in Late Adolescence
Kristin N. Javaras Chapel Hill, NC; Gregory R. Kirk, Cory A. Burghy, Diane E. Stodola, Marjorie H. Klein, Marilyn J. Essex, Richard J. Davidson Madison, WI

Background: Despite evidence of adiposity-related differences in cortical and striatal function during response inhibition and food-reward tasks, respectively, few studies have examined associations between cortical thickness and adiposity or subcortical volumes and adiposity in late adolescence. Methods: We investigated the cross-sectional relationship between cortical thickness and adiposity and between striatal volume and adiposity in late adolescence. Participants (n = 99; 54.5% female; 18-19 years old) were selected from among a cohort of individuals followed longitudinally from gestation to late adolescence. T1-weighted structural images (1 mm^3 voxels) were acquired using a 3T MRI scanner. Cortical thickness and subcortical volumes were calculated using the FreeSurfer image analysis suite (v5.1.0). Height, weight, and waist circumference were measured by a staff member during a laboratory visit prior to the scanning session. Results: Greater adiposity was associated with reduced cortical thickness in posterior regions (including inferior and superior parietal cortex and lateral occipital cortex). However, greater adiposity was not associated with reductions in cortical thickness in prefrontal regions implicated in response inhibition. In addition, greater adiposity was positively associated with mean (left and right) volume of the nucleus accumbens area and the putamen. Conclusions: Results suggest that greater adiposity in late adolescence is associated with increased volume of the nucleus accumbens and putamen, as well as reduced cortical thickness in posterior regions. Additional research will be required to determine whether these differences are antecedents or consequences of increased adiposity.
OBESITY 2013 ABSTRACT BOOK

ORAL ABSTRACTS – SATURDAY, NOVEMBER 16, 2013

T-88-OR
Interplay between Adipose Tissue Macrophages and CD4+ T Cells Regulates Obesity-Induced Inflammation
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Background: Obesity leads to dynamic changes in a range of adipose tissue leukocytes that contribute to inflammation that includes macrophages and T cells. We have examined the interactions between adipose tissue macrophages (ATM) and adipose tissue T cells (ATT) and how they contribute to metainflammation. Methods: Intravital microscopy with multiphoton confocal techniques was used to evaluate T cell trafficking in adipose tissue of live mice. T cells were labeled with CFSE and localized in relation to fluorescent ovalbumin. Chimeric mice with CD11c-DTR bone marrow were injected with PBS or DT for 2 weeks to evaluate T cell content and metabolism. Mice were injected with MHCIi blocking antibodies and T cell proliferation assessed with BrDU labeling. Results: Intravital microscopy demonstrated direct and dynamic interactions between ATMs and ATTs in visceral fat that were antigen dependent. Diet-induced obesity increased the expression of MHCIi and co-stimulatory molecules in fat, which correlated increased CD4+ ATT proliferation. Ablation of CD11c+cells (CD11c-DTR) and antibody neutralization of MHCIi decreased ATT proliferation and numbers. These interventions shifted the balance from Tconv to Treg cells and altered adipose tissue cytokine gene expression. Both CD11c+ cell ablation and MHCIi knockout mice demonstrated decreased obesity-induced insulin resistance and adipose tissue inflammation. Conclusions: CD4+ T cells and Macrophages interact dynamically in an antigen dependent way. ATM ablation improves metabolism and decreases T cell content in fat. Suppression of T cells alone does not decrease ATM content and does not improve metabolic parameters in obese mice. This suggests that CD4+ conventional T cells may be dispensable in established obesity but may play a more prominent role in the initiation of metainflammation.

T-89-OR
The Inflammatory Response to Overfeeding Influences Ectopic Fat Deposition and Insulin Sensitivity
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Background: Obesity is associated with impaired insulin sensitivity and low-grade inflammation triggered by adipose-derived cytokines. Since cytokines are known to impact energy and fat balance, we investigated the association between inflammation and fat gain in response to high-fat overfeeding in humans. Methods: We overfed 29 young (27±5) healthy men (BMI 25.5±2.3) 40% above their baseline energy requirements for eight weeks (41% CHO, 15% protein, 44% fat). Subcutaneous abdominal (SAT) and visceral (VAT) adipose tissues were measured by MRI, intramyocellular lipid (lMCL) by Oil Red O staining (vastus lateralis, VL), intraperitoneal lipid (IHL) by 1H-MRS, whole-body fat mass (FM) by DXA, and glucose disposal by hyperinsulinemic, euglycemic clamp (50 mU/min/m2). Inflammation was measured in serum (hsCRP, IL-6) and subcutaneous abdominal adipose tissue (AT, IL-6). Results: Participants gained 7.6±2.1 kg, 58% of which was fat. SAT increased by 1.3±0.25 kg (31%), VAT by 0.4±0.2 kg (63%) and IHL by 0.7±2.8% lipid (47%); however there was no change in VL lMCL. Serum hsCRP and IL-6 both increased by 27% (P=0.04 and P=0.15 respectively). Independent of baseline levels, the change in circulating IL-6 was positively associated with the change in VL lMCL (r=0.40, P=0.03), IHL (r=0.42, P=0.03), and negatively with the change in glucose disposal (r=−0.61, P=0.001). Participants who had an increase in AT IL-6 gene expression during overfeeding gained significantly less FM (r=−0.55, P=0.017) and had a lesser relative increase in body weight (r=−0.53, P=0.02). Conclusions: The inflammatory response to energy excess may predict where fat is deposited, i.e. a greater response may promote ectopic (muscle, liver) lipid accumulation while limiting the deposition in ‘appropriate’ fat depots (adipose tissue) thereby contributing to overfeeding-induced insulin resistance.

T-90-OR
Epigenetic Regulation of Macrophage Polarization by DNA Methyltransferase 3b (DNMT3b)
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Background: Macrophage inflammation is important in obesity-induced insulin resistance. Classiclly activated M1 macrophages are pro-inflammatory whereas alternatively activated M2 macrophages are anti-inflammatory. Methods: In this study we aim to determine the role of DNMT3b in regulating macrophage polarization and inflammation. Results: DNMT3b was signficantly induced in macrophages exposed to the saturated fatty acid (SFA) stearate and the pro-inflammatory cytokine TNFα, was higher in macrophages isolated from obese mice, but is significantly lower in M2 vs. M1 macrophages. DNMT3b knockdown promoted macrophage polarization to an alternatively activated M2 phenotype, and prevented lipopolysaccharide- and steartate-induced pro-inflammatory gene expression; whereas Over-expressing DNMT3b in macrophages profoundly suppressed interleukin 4-induced alternative macrophage polarization. Peroxosaurs prodictor-activated receptor γ1 (PPARγ1) is a key transcriptional factor that controls macrophage alternative activation. The promoter and 5’-untranslated regions of PPARγ1 are enriched with CpG sites. Chromatin immunoprecipitation assay (ChIP) showed that stearate significantly enhanced DNMT3b binding to PPARγ1 promoter. Pyrosequencing analysis also revealed that stearate increased DNA methylation at PPARγ1, which was prevented by DNMT3b deficiency. Interestingly, stearate increased the histone-repressive marker H3K9me3 at PPARγ1 promoter, which was blocked by DNMT3b knockdown. Finally, in a macrophage-adipocyte co-culture system, 3T3L1 adipocytes co-cultured with DNMT3b knockdown macrophages have significantly improved adipocyte insulin signaling. Conclusions: In summary, DNMT3b regulates macrophage polarization through epigenetic mechanisms. Inhibiting DNMT3b may serve as a therapeutic target in inhibiting macrophage inflammation and insulin resistance in obesity.

T-91-OR
Elevated Preadipocyte Proliferation and Differentiation During the Early Stages of Relapse in an Experimental Paradigm Modeling Weight Regain After Weight Loss
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Background: Diet-induced obese (DIO) rats exhibit an increase in adipocyte number in response to weight regain after weight loss. In this study, we utilized a stable isotope to test the hypothesis that this increase in adipocyte number is the result of an accelerated rate of preadipocyte proliferation and differentiation during the early stage of relapse. Methods: DIO rats were fed ad libitum (Obese) or placed on a calorie-restricted, low fat diet that reduced body weight (15%) and fat mass (30%) over an 8 week period, with 4% deuterium (2H2O) in drinking water. Stomal (SV) and nonstomal fractions of retroperitoneal adipose tissue were isolated from both Obese and weight reduced rats with (relapse, REL) or without (WR) 3-days of ad libitum feeding (n=6-8/group). Results: Enrichment of 2H within DNA was normalized to the enrichment of bone marrow. Fractional enrichment of whole tissue, isolated small (5-40uM) and larger (80-250uM) adipocytes, and SV cells was lower in both WR and REL when compared to Obese (P<0.05). REL rats exhibited a higher fractional enrichment of both SV cells and small adipocytes relative to WR (P<0.05), and small adipocytes in REL had a high expression of genes involved in lipid uptake and storage. Conclusions: These data provide evidence of accelerated preadipocyte proliferation and differentiation during the early stage of relapse, resulting in a generation of new adipocytes with a high capacity to store energy. This change in adipocyte cellularity likely contributes to rapid, energetically efficient weight gain and may lead to a permanent expansion in the capacity to store fat.
T-92-OR
IL-10 Inhibits Lipopolysaccharide Induced TNF-α and IL-6 Secretion in Human Visceral Adipose Tissue
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Background: Interleukin (IL)-10 is a pleiotropic cytokine involved in the regulation of inflammatory responses. Whether IL-10 can exert effects on human adipose tissue, a key driver of inflammation in obesity, remains controversial. Our aim was to determine whether IL-10 can exert anti-inflammatory responses in human visceral adipose tissue. Methods: Human preperitoneal adipose tissue samples were obtained from 4 male (age 57±7 yr, body mass index (BMI) 27.0±1.6 kg/m2) and 3 females (age 54±13 yr, BMI 22.5±0.4 kg/m2) subjects undergoing abdominal surgeries. Using an established adipose tissue organ culture technique that maintains intercellular interaction between adipocytes, endothelial cells, macrophages and other immune cells, 250 mg of adipose tissue was minced into ~5-10 mg pieces and placed into culture dishes containing 7.5 ml of M199 media overnight. On the morning of the experiment, media was replaced with fresh M199 and cultured adipose tissue was left untreated (Control) or treated with lipopolysaccharide (LPS; 100 ng/ml) or LPS + IL-10 (1 and 100 ng/ml). Media were collected for assessment of TNF-α (6 hr) and IL-6 (18 hr) secretion via ELISA. Results: High dose IL-10 (100 ng/ml) completely blunted LPS-induced TNF-α and IL-6 secretion (P<0.05 vs. LPS alone and LPS + 1 ng/ml IL-10), whereas IL-10 at 1 ng/ml resulted in partial inhibition of LPS-induced TNF-α and IL-6 secretion (P<0.05 vs. LPS alone). Conclusions: These findings indicate that IL-10 can inhibit LPS-induced inflammation in human visceral adipose tissue. Ongoing studies are exploring the involvement of IL-10 in reducing astrogliosis through SH2 domain-containing cytoplasmic 5’ phosphatase 1 (SHIP1) and signal transducer and activator of transcription 3 (STAT3) as possible mechanisms involved in the anti-inflammatory effects of IL-10 in human adipose tissue.

T-93-OR
Rutin Suppresses Palmitic Acids-Triggered Inflammation in Macrophages and Blocks High Fat Diet-Induced Obesity and Fatty Liver in Mice
Mingming Gao, Yongjie Ma, Dexi Liu Athens, GA

Background: The objective of this study is to elucidate the mechanism of rutin in blocking macrophage-mediated inflammation and high fat diet-induced obesity and fatty liver. Methods: Both in vitro and in vivo approaches were taken in evaluating the effects of rutin on palmitic acids-triggered inflammation in cultured macrophages, and on weight gain and development of fatty liver of mice fed a high fat diet. Results: Palmitic acids increase mRNA levels of pro-inflammatory cytokines including Tnfα, Ifng, Il1β and Il6, and elevate the production of TNFα in cultured macrophages. Pre-exposure of rutin to cells greatly suppressed these elevations. The suppressed inflammation by rutin was correlated with a decrease in transcription of genes responsible for ER stress and production of reactive oxygen species. In vivo, rutin protects mice from high fat diet-induced obesity, fatty liver and insulin resistance. The protective effects were associated with lack of hyperglycemia and crown-like structures in the white adipose tissue, decreased mRNA levels of marker genes for macrophages including F4/80, Cd11c and Cd68, and repression of transcription of genes involved in chronic inflammation such as Mcp1 and Tnfsf1. In addition, rutin increases the expression of genes responsible for energy expenditure in brown adipose tissue including Pgc1a, Dio2, and Elov13. Furthermore, rutin suppresses transcription of Srebp1c and Cd36 in the liver, leading to a blockade of fatty liver development. Conclusions: These results suggest that supplementation of rutin is a promising strategy for blocking macrophage-mediated inflammation and inflammation-induced obesity and its associated complications.

T-94-OR
Influence of Fitness and BMI on Cardiac Structure and Function in Overweight and Obese Adults
John M. Jakicic, Renee J. Rogers, Erik B. Schelbert Pittsburgh, PA

Background: There is debate over the independent influence of obesity and fitness on health outcomes such as cardiovascular disease. This study examined the association of body mass index (BMI) and cardiorespiratory fitness on cardiac structure and function assessed from magnetic resonance imaging (CMRI) in overweight and obese adults. Methods: Overweight and obese adults (n=101; age range=18 to 55 years; BMI=32.1±3.5 kg/m2) provided data prior to engagement in a randomized clinical trial. Fitness was assessed with graded exercise test, with speed set at 80.4 m/min and grade increase 1% per minute until test termination. CMRI using a 1.5 Tesla system included resting measures of left ventricular mass (LVM), end-diastolic volume (EDV), end-systolic volume (ESV), and ejection fraction (EF). Results: Duration of the graded exercise test was 8.3±3.1 minutes. Results of CMRI were: LVM=90.9±21.1 grams; EDV=146.2±28.4 ml; ESV=55.0±16.0 ml; EF=63.5±6.9%. BMI was significantly correlated with LVM (r=0.30, p=0.002) but not EDV (r=0.19, p=0.06), ESV (r=0.04, p=0.67) or EF (r=0.10, p=0.33). Fitness was significantly associated with LVM (r=0.37, p=0.001) and EDV (r=0.28, p=0.004), but not ESV (r=0.19, p=0.06) or EF (r=0.12, p=0.25). After controlling for BMI, the strength of the association between fitness and CMRI measures increased for LVM (r=0.52, p=0.001), EDV (r=0.38, p<0.001), and ESV (r=0.21, p=0.03), but remained non-significant for EF (r=0.15, p=0.13). Conclusions: Fitness is an important predictor of CMRI measures of cardiac function and structure in overweight and obese adults, and this association may be independent of BMI. Thus, improvement in fitness, in addition to weight loss, should be a goal of interventions for obese adults as this may maximize the health benefits of these interventions. Supported by NIH (R01 HL103646)
Prediabetes Phenotype Influences Improvements in Glycemia with Resistance Training

Joshua D. Eikenberg, Roanoke, VA; Jyoti Savla, Elaina Marinik, John F. Pownall, Mary E. Baugh, Kyle Flack, Richard A. Winnett, Brenda M. Davy Blackburg, VA

Background: Pathophysiological differences exist between individuals with impaired fasting glucose (IFG) and impaired glucose tolerance (IGT). Current guidelines recommend resistance training (RT) for diabetes prevention, yet differences in response to RT based on prediabetes phenotype (IGT, IFG, or combined) have not been investigated. Our objective was to determine if prediabetes phenotype influenced improvements in glycemia with RT.

Methods: Older, overweight individuals with prediabetes (n = 159) completed a supervised, full-body RT program twice/week for 12 weeks. Body weight and composition (DXA), strength, fasting plasma glucose, and 2-hr oral glucose tolerance (OGT) were assessed at baseline and week 12.

Results: Participants (aged 60-5 yrs; BMI 33±4 kg/m2) were categorized as IFG only (n = 73), IGT only (n = 21), or COM (n = 65). In the full sample, improvements in waist circumference (-0.9 cm), body fat (-0.6%), lean body mass (+0.7 kg), leg muscle (+25.3 kg [+18%]) and chest press strength (+9.1 kg [+27%]) were noted (all P < 0.05). Differences by prediabetes phenotype were detected over time in body fat %, lean body mass, and OGT. Improvements in OGT with RT differed by group (IFG: pre 113±23 mg/dL, post 114±28 mg/dL; IGT: pre 111±13 mg/dL, post 119±20 mg/dL; COM: pre 141±20 mg/dL, post 155±36 mg/dL; P = 0.05). There were no group differences in change in fasting plasma glucose.

Conclusions: RT may improve OGT but not fasting plasma glucose in individuals with prediabetes. Individuals with IGT or combined IFG+IGT may benefit more from RT, as compared to those with IFG alone, with regard to improvements in glycemia.

T-97-OR

Exercise Training in Overweight Children Improves Fitness and Fatness but Not Markers of Hepatic Steatosis or Fibrosis

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Background: Currently, there is a paucity of evidence concerning the benefits of aerobic exercise as prevention for nonalcoholic fatty liver disease. This study determined the effect of 8 months of after school, aerobic exercise training on markers of hepatic steatosis and fibrosis in overweight children.

Methods: Overweight, sedentary children (N = 175, 8-11 years, 61% male, 87% black, 74% obese) were randomly assigned to an aerobic exercise program (40 min/d, n = 90) or a no-exercise control condition (n = 85) for 8 months (5 d/wk). At baseline and posttest, the following measurements were assessed: cardiovascular fitness, percent body fat by DXA, hepatic fat by MRI, liver stiffness measurement by transient elastography (Fibroscan), alanine aminotransferase (ALT), and C-reactive protein.

Results: The study had 89% retention rate (n = 155). The exercise group had 59% attendance during the intervention period. The exercise vs. control group had greater improvements in cardiorespiratory fitness as determined by VO2 peak test, and percent body fat (-4.7% vs. -2.1%) (both P < 0.04). There was no group x time effect on hepatic fat, liver stiffness, ALT, or C-reactive protein (all P > 0.05).

Conclusions: In this 8-month randomized controlled trial, 40 min/d of aerobic exercise training did not influence markers of hepatic steatosis or fibrosis in overweight children, despite improved fitness and fatness.

T-98-OR

Exercise Provides an Additive Improvement in Insulin Sensitivity and Glucose Effectiveness Following Roux-en-Y Gastric Bypass: A Randomized Trial

Paul M. Coen Pittsburgh, PA; Charles J. Tanner Greenville, NC; Nicole L. Heibling Pittsburgh, PA; Gabriel S. Dubis Greenville, NC; Hui Xie, Steven R. Smith Orlando, FL; George Edr, Frederico G. Toledo Pittsburgh, PA; Joseph Hounard Greenville, NC; Brett H. Goodpaster Pittsburgh, PA

Background: Roux-en-Y Gastric Bypass (RYGB) surgery generally has profound effects on weight loss and glucose metabolism in severely obese patients. Although exercise can improve insulin sensitivity in mild to moderate obesity, the potential of exercise to improve insulin sensitivity beyond that observed following RYGB is unknown. We hypothesized that exercise would result in greater improvements in insulin sensitivity following RYGB compared to surgery alone.

Methods: 1-3 months following RYGB, participants (N = 128) were randomized to 6-months of either moderate structured exercise (EX, N = 66), or lifestyle education control (CON, N = 62). Main outcomes included insulin sensitivity (SI) and glucose effectiveness (Sg), determined by intravenous glucose tolerance test and minimal modeling. Secondary outcomes were cardiorespiratory fitness as determined by VO2 peak test, and body composition by DXA. Data were analyzed using an intention-to-treat (ITT) and per-protocol (PP) approach to assess the efficacy of exercise performed (<120 min/wk).

Results: The completion rate was 93% for CON and 91% for EX. There was a significant decrease in fat mass for both groups (P < 0.001 for time effect). Insulin sensitivity improved in both groups following the intervention (ITT: CON vs. EX < 0.05; 0.001 for time effect). A per-protocol analysis revealed that exercise had an additive effect on SI (PP: CON vs. EX < 0.05 vs. 2.0% for group*time effect). Exercise also had an additive effect on improvement in Sg (ITT: CON vs. EX < 0.002 vs. 0.006, P = 0.0019 for group*time effect). Cardiorespiratory fitness was improved in EX but not in CON. Conclusions: Moderate exercise following RYGB surgery provides additional improvements in insulin sensitivity and cardiorespiratory fitness. Clinicaltrials.gov identifier: NCT00869236. Supported by R01DK078192

T-99-OR

The Impact of Exercise Counseling on Physical Activity among Bariatric Surgery Patients

David Creel, Leslie M. Schuh, Adrienne Gomez, Christina Reed, Lori Hurst, Brenda M. Cacucci, David Diaz, Christopher M. Evanson, John M. Huse, Margaret M. Inman, Douglas Kadarabek, Ted Eads Carmel, IN

Background: This ongoing study examines exercise promotion through pedometer use and exercise counseling among bariatric surgery patients.

Methods: Participants (n = 60) were randomly assigned to usual care (U), pedometer use (P), or individualized exercise counseling (C) before through 6 months postoperatively. Participants wore GT3X accelerometers (ActiGraph TM) for approximately two weeks preoperatively and 2, 4, and 6 months postoperatively. The C (n = 20) group participated in 7 individual sessions, were pedometers and kept activity journals; the P group (n = 14) wore pedometers and recorded daily steps. Usual care participants (n = 26) received printed materials and group education promoting physical activity. All participants completed pre- and 6 ½ month post-op treadmill protocols and strength testing.

Results: Most participants had roux-en-y gastric bypass (75%), were Caucasian (85%), and female (83%). Mean weight and BMI were 133.1 kg and 47.3 kg/m2, respectively. Before surgery there were no significant differences in time in moderate activity, steps/day, treadmill time or strength variables. At 6 months post op, C spent significantly more time (31 min/d) in moderate activity compared to U (18 min/d). Daily step counts were 6941, 5530 and 5338 for C, P, and U, showing trends toward more steps for C compared to U (p = 0.086). ½ month treadmill times were longer in C than in U (p = 0.064). Repeated measures ANOVA of all participants combined showed a decrease in dominant hand strength and chest press repetitions, and an increase in treadmill time. Mean weight loss and BMI decrease were 40.1 kg and 13.8 kg/m2.

Conclusions: Bariatric surgery results in improved cardiovascular endurance but loss of upper body strength. Physical activity counseling leads to improved time spent in moderate activity and appears to improve cardiovascular endurance more than usual care.

T-100-OR

Common Bacterial Genera Abundance is Associated with Anthropometric and Percent Body Fat Measurements in Young Caucasian Children

Anthony Wang, Mei Wang, Franck Carbonero, Sharan M. Donovan, H. R. Gaskins, Margarita Teran-Garcia Urbana, IL

Background: In 2010, 31.8% of children in the United States were considered overweight. Differences in the gut microbiota are associated with obesity in mice and adult humans, but less is known about child obesity. The human distal gut is inhabited by two predominant phyla: Bacteroidetes and Firmicutes. Bacterial species within Clostridium cluster IV are members of the Firmicutes phyla. Several are butyrate producers and have an important role in the metabolism of short chain fatty acids.
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role in gut health. Methods: Herein, the association between abundance of several bacterial groups and obesity was studied in Caucasian children (4-7 yrs) recruited from the STRONG Kids Research Program. Quantitative RT-PCR was conducted on DNA extracted from fecal samples for Clostridium cluster XIVa, Clostridium cluster IV, Lactobacillus spp., Bifidobacterium spp. and Bacteroides-Prevotella group. Height and weight were measured to calculate BMI, and whole body percent fat (%BF) was measured by dual energy X-ray absorptiometry. Results: When comparing overweight and obese (ow/ob, n=6) to lean (n=12) children, Clostridium cluster IV levels were lower in ow/ob than lean individuals. This relationship was also observed by stepwise regression, where BMI was negatively associated with Clostridium cluster IV with sex as the only other variable in the model. Differential relationships between %BF and bacterial abundance were also observed when separating by sex. Bifidobacterium spp. was negatively associated with %BF in girls. Conclusions: While these findings suggest a role for Clostridium cluster IV and BMI, the mechanism of this interaction and butyrate production remains to be elucidated. Our results support previous reports suggesting Bifidobacterium spp. may protect against the development of obesity.

T-101-OR
Oral Health Behaviors and Metabolic Syndrome
Yang-Hyun Kim Ansan, Republic of Korea; Jun Goo Kang Anyang, Republic of Korea; Chang Beom Lee Guri, Republic of Korea; Ki-Young Lee Incheon, Republic of Korea
Background: The prevalence of Metabolic syndrome (MetS) is increasing worldwide, especially in South Korea. Among general health behaviors, oral health behaviors including toothbrushing and use of secondary oral products were related with MetS in some studies. This study examined whether oral health behaviors are associated with MetS in Korean adults involved in the 2008-2010 Korea National Health and Nutrition Examination Survey (KNHANES). Methods: A total of 18,742 subjects (8,034 men and 10,708 women) were included. MetS was defined according to the criteria of the American Heart Association/National Heart, Lung, and Blood Institute Scientific Statement for Asians. Oral health behavior was assessed using a questionnaire included in the KNHANES. Results: Subjects with MetS brushed their teeth less frequently and used fewer secondary oral products than subjects without MetS (p < 0.01). As frequency of toothbrushing and number of secondary oral products increased, body mass index, waist circumference, diastolic blood pressure, fasting plasma glucose, triglyceride, and white blood cell count decreased, but high density lipoprotein-cholesterol increased (all p for trend < 0.01). In the multivariable logistic regression models, as frequency of toothbrushing increased, the odds ratios (ORs) for MetS, abdominal obesity, hyperglycemia decreased (p for trend < 0.01) after adjusting for age, gender, education, income, alcohol and tobacco use, and physical activity. The ORs for MetS, abdominal obesity, and high blood pressure were more than one in subjects who do not use dental floss. Conclusions: MetS is associated with infrequent daily toothbrushing and use of dental floss in South Korean.

T-102-OR
Andrew W. Brown, David B. Allison Birmingham, AL
Background: The likelihood of a paper being cited is dependent on factors such as study topic, quality of the science, and journal. It is unclear if the citation counts are dependent on the study’s agreement with popular opinion. Evaluating literature to answer such questions can be time consuming, and crowdsourcing may be a feasible way to evaluate a large volume of research. Methods: Human studies in PubMed from 2007 through 2011 with major headings of food and obesity were obtained. Abstracts were limited to studies demonstrating or implying effects of foods on obesity by using Amazon’s Mechanical Turk (MT) to crowdsource abstract evaluation. Foods in abstracts were identified and confirmed iteratively using MT. Abstract conclusions were categorized using MT as indicating the food was beneficial, detrimental, or not related to obesity, or dependent on multiple factors. MT workers were asked their opinions about the obesogenicity of the food in each abstract. MT was used to determine the number of times a paper was cited according to Google Scholar. Citation counts were modeled against the agreement between opinions and abstract conclusions. Results: Of the 689 abstracts submitted to MT, only 9 needed to be fully rated by an investigator. Preliminary results show 137 abstracts met all inclusion criteria, including containing foods known by >70% of respondents. The number of times these papers were cited was not associated with the study conclusions, respondent opinions of the foods being studied, or agreement between the conclusions and opinions. Conclusions: Citation counts in nutrition-obesity research were not associated with the agreement between study conclusions and popular opinion in this set of data. Crowdsourcing proved to be a feasible way to evaluate a large volume of research.

T-103-OR
Prospective Association between Sleep Duration and Weight Gain among Female Adolescents and Young Adults
Kendrin R. Sonneville, Emily A. Blood Boston, MA; Jess Haines Guelph, Canada; Alan Flint, Carlos A. Camargo, Alison E. Field Boston, MA
Background: Short sleep duration is a risk factor for obesity in youth and adults, although the mechanisms driving the association are not well understood. Prospective studies of sleep and weight gain are sparse, particularly during the transition from adolescence to adulthood, a period when a dramatic rise in obesity prevalence is observed. We further explored whether factors previously associated with short sleep duration (more binge eating, more emotional eating) were related to sleep-BMI association. Citation counts in nutrition-obesity research were not associated with the agreement between study conclusions and popular opinion in this set of data. Crowdsourcing proved to be a feasible way to evaluate a large volume of research. Methods: Citation counts in nutrition-obesity research were not associated with the agreement between study conclusions and popular opinion in this set of data. Crowdsourcing proved to be a feasible way to evaluate a large volume of research. Results: Of the 689 abstracts submitted to MT, only 9 needed to be fully rated by an investigator. Preliminary results show 137 abstracts met all inclusion criteria, including containing foods known by >70% of respondents. The number of times these papers were cited was not associated with the study conclusions, respondent opinions of the foods being studied, or agreement between the conclusions and opinions. Conclusions: Citation counts in nutrition-obesity research were not associated with the agreement between study conclusions and popular opinion in this set of data. Crowdsourcing proved to be a feasible way to evaluate a large volume of research. Methods: Citation counts in nutrition-obesity research were not associated with the agreement between study conclusions and popular opinion in this set of data. Crowdsourcing proved to be a feasible way to evaluate a large volume of research.
T-105-OR
Simulating Obesity Development in a Young Population Through Consistent and Holiday Overeating
Grant Zhao Sugar Land, TX; Kevin D. Hall Bethesda, MD

Background: Studying the process of obesity development in a real human population is difficult. However, mathematical modeling of human metabolism and body weight simulations can provide important insights into both obesity development and its treatment. Methods: We used a previously validated mathematical model of human metabolism to investigate obesity development in a virtual population of 1000 male and 1000 female 18 year old individuals created by randomly sampling from the normal height and weight distributions obtained from US population survey data (NHANES). Three samples, each consisting of 100 men and 100 women, were randomly selected from “normal weight”, “overweight”, and “obese” categories according to BMI. Two simulation case studies were performed: consistent overeating by varying excess daily Calories and holiday overeating by adding 550 kcal/d to the baseline energy-balanced diet during a 40 day holiday season, after which the baseline diet was resumed. Results: The simulations showed: (i) the time for normal weight individuals to become obese decreases exponentially with the amount of extra daily Calories consumed; (ii) body weight gain from a single 40 day season of holiday overeating lasts for more than one year, and thus yearly holiday overeating generates an accumulative weight gain; (iii) compared to normal weight individuals, obese individuals have a higher excess energy-to-fat conversion rate (71% vs. 62%); (iv) continued yearly holiday overeating for 10 years results in a weight gain plateau with an average of 12.4 kg of weight gain in obese individuals vs. 10.6 kg in normal weight individuals. Conclusions: Our study shows a novel approach for quantitatively understanding how consistent and holiday overeating can lead to obesity development in a young population. These results may provide useful information for obesity prevention.

8:30 AM – 10:00 AM
Oral Abstracts Track 4 - Understanding Underreporting of Weight and Dietary Intake
T-106-OR
Underreporting of Self-Reported Dietary Energy Intake in Five Populations of African Diaspora
Dale A. Schoeller, Lindsay Orcholski Madison, WI; Amy Luke Mayo, I; Pascal Bovet Lausanne, Switzerland; Terrence Forrest Kingstone, Jamaica; Estelle V. Lambert Cape Town, South Africa; Jacob Plange-Rhule Kumanzi, Ghana; Lara Dugas, Elizabeth Kettmann, Ramon A. Durazo-Arvizu, Richard S. Cooper Mayo, I

Background: Studies of the role in the diet of the development of chronic diseases often rely on self-reported questionnaires of dietary intake. Unfortunately, many validity studies have demonstrated that self-reported dietary intake is subject to systematic underreporting, but the vast majority of such studies have been conducted in industrialized countries. Methods: The aim of this study was to investigate systematic reporting error in individuals of African ancestry (n=324) in five countries distributed across the human development index scale. Using 24-hour recalls to assess dietary intake and the doubly labeled water method to assess total energy expenditure, we calculated the difference between these two values to identify underreporting of habitual energy intake in selected communities in Ghana, South Africa, Seychelles, Jamaica and the United States. Results: Under-reporting of habitual energy intake was observed in all countries. South Africans displayed the greatest under-reporting of -52.1% ([self-report - expenditure/ expenditure]x100) compared to -22.5%, -17.9%, -25.0%, and -18.5%, for, Ghana, Jamaica, Seychelles and the United States, respectively. BMI was the most consistent predictor of underreporting compared to other markers. Conclusions: We conclude that there is substantial under-reporting in populations across the whole range of the human development index and that this systematic error increases according to an individual’s BMI. METS is supported by NIH.

T-107-OR
Does the Accuracy of Weight Status Reporting in Young Adults Vary by Race/Ethnicity? Findings from the National Longitudinal Study of Adolescent Health
Tracy K. Richmond, Carly Miliren, Kendrin R. Sonneville, Idia B. Thurston, Courtney E. Walls, S. Bryn Austin Boston, MA

Background: Surveillance data describing the weight status of the U.S. population often rely on self-reported height and weight. Accuracy may vary by sociodemographic characteristics. We set out to determine if there were racial/ethnic differences in accuracy of self-reported body mass index (BMI) in a nationally representative sample of young people. Methods: Using gender-stratified multiple linear regression to analyze Wave III of the National Longitudinal Study of Adolescent Health (n=12,940) when participants were aged 19-26, we examined the association of self-reported BMI (i.e., BMI calculated from self-reported height and weight) and race/ethnicity, controlling for measured BMI (i.e., BMI calculated from height and weight measured by study staff). Models were adjusted for factors known to influence weight self-perception: age, household income, parental education, level of physical activity, and depression score. Results: The population underestimated their BMI (females: beta=0.87, p<0.001; males=0.86, p<0.001) by 13-14%. However, there was variation in underreporting by race/ethnicity. Among females, Blacks (beta=0.54, CI: 0.18, 0.89) and Hispanics (beta=0.37, CI: 0.10, 0.63) reported significantly higher BMIs (i.e., closer to their measured BMI) relative to their similarly-weighted White peers. Similarly, Black (beta=-0.24, CI: 0.03, 0.45) and Hispanic (beta=-0.34, CI: 0.09, 0.58) males reported higher BMIs (i.e., were more accurate) than their White peers, accounting for measured BMI. There were no differences in accuracy of self-reported BMI among other racial/ethnic groups relative to Whites in either gender. Conclusions: While all youth underreported their BMI, Blacks and Hispanics were more accurate relative to their similarly weighted White peers. Studies relying on self-reported BMI may exaggerate racial/ethnic weight differences.

T-108-OR
Physical Characteristics Associated with Weight Underestimation among Overweight and Obese Men: NHANES 1999-2006
Dwight W. Lewis, Olivia Alfuso, Gareth R. Dutton, David B. Allison Birmingham, AL

Background: Research suggests that weight underestimation is negatively associated with attempts to lose weight. It is unknown whether physical characteristics are associated with increased weight underestimation. The objective of our study was to examine associations of weight underestimation with anthropometric and body composition measures among overweight and obese men. Methods: We used data from a nationally representative sample of 3,679 overweight or obese men ages 20-79 years old with a dual energy x-ray absorptiometry (DXA) derived total body fat percent > 25% (White: n=1,992; Black: n=664; Mexican American: n=1,023) from the 1999-2006 National Health and Nutrition Examination Surveys. Weight underestimation was defined as participants who classified themselves as either “underweight” or “about right weight.” Logistic regression was used to examine the association between weight underestimation and participants’ physical characteristics. Predictor variables included DXA derived total percent leg (DXA-%L) and arm (DXA-%AF) fat, obesity status, height, waist circumference, race/ethnicity, and age. Results: Weight underestimation (prevalence, 95% CI) was highest among Black (44.0%, 39.2-48.9%) followed by Mexican American (41.9%, 38.6-45.3%) and White men (26.5%, 24.6-28.4%). Physical characteristics associated with weight underestimation (OR, 95% CI) were decreased DXA-%AF (0.95, 0.91-0.98), having a BMI 25.0-29.9 (9.02, 5.34-15.24), and having a waist circumference ≥ 94 cm (2.31, 1.72-3.09), irrespective of race/ethnicity. Conclusions: Findings suggest that overweight men should not rely on visual cues to determine obesity status. Therefore, other strategies for helping overweight men to recognize unhealthy weight may need to be developed.
T-109-OR
Adjusting for Differential Error in Energy Intake Reports in Race-Specific Analysis of Diet and BMI Associations: The CARDIA Study
Katie Meyer, Michelle A. Mendez Chapel Hill, NC; Arlene Hankinson Chicago, IL; Lyn M. Steffen Minneapolis, MN; Catherine M. Lora, Tiffany M. Powell-Wiley Bethesda, MD; Penny Gordon-Larsen Chapel Hill, NC

Background: It is not known how adjusting for misreporting of energy intake impacts race- and sex-specific estimates of diet-BMI associations, of interest given race and sex disparities in obesity. Methods: We used data from yr 0, 7, and 20 of CARDIA, a biracial cohort study (n=5,115), aged 18-30 at baseline (1985-86) with detailed diet history and physical activity surveys and measured anthropometry (weight/kg; height/m) at each wave. We created a summary diet quality score consistent with a Mediterranean-style diet. We used standard equations to estimate basal metabolic rate (BMR) from weight, height, age, and sex, defining reporting error as the deviance (±1.5 SD) between reported energy intake (rEI) and energy needs based on BMR and physical activity level. We tested for differential reporting error by race and sex, and examined the impact of adjusting for reporting error on cross-sectional associations (yr 0, 7, 20) between diet quality and BMI in multi-variable-adjusted linear regression models. Results: At year 20, whites, as compared to blacks, were more likely to underreport (25 vs 22%) and less likely to overreport (7 vs 10%) energy intake (p<0.01). We found race-specific associations between diet quality and BMI (p, interaction<0.01): diet quality [mean(SD): 71(13)] and BMI [30(7)] were inversely associated in whites (β=-0.08, SE=0.02) but not blacks (β=-0.02, SE=0.02). Adjusting for reporting error did not significantly change race-specific associations. Conclusions: We found evidence for differential reporting error for energy intake by race, but adjusting for reporting error using our method did not alter diet quality-BMI associations.

T-110-OR
A System Dynamics Model for Estimating Energy Imbalance that Can Explain U.S. Adult Obesity Trends
Saiedeh Fallah-Fini Baltimore, MD; Hazhir Rahmandad Falls Church, VA; Terry Huang Omaha, NE; Thomas A. Glass Baltimore, MD; Regina Bures Bethesda, MD

Background: Quantifying the energy imbalance gap that can explain the obesity epidemic in different subpopulations is important for understanding the magnitude of changes required to reverse the epidemic, providing intervention targets, and estimating the contribution of different causes. We present a novel population-level System Dynamics model for quantifying the energy imbalance gap responsible for the U.S. adult obesity epidemic. We show how this model explains obesity patterns across gender, age, and race/ethnicity subpopulations. Methods: Our System Dynamics model divides the U.S. adult population into J subpopulations based on gender, race/ethnicity and age, and further into BMI (Body Mass Index) groups. Transition rates between these groups are then defined as a function of metabolic dynamics of individuals in these groups according to existing models of body weight dynamics. The energy intake in group Ji at time t is then estimated as a multiplication of the equilibrium energy intake of individuals in that group by an energy gap multiplier. Through calibration, the energy gap multiplier for each group is estimated by maximizing the match between simulated BMI distributions for each gender/race/age group against data from NHANES using maximum likelihood estimation. Results: Preliminary results using white adult females as a test case suggest that the trajectory of increasing BMI is consistent with a 50 kcal/day positive energy imbalance, providing confidence to the utility and credibility of this new methodology. We apply our method to all other subpopulations for this presentation. Conclusions: System Dynamic models offer potentially useful tools for researchers and policy makers. We illustrate how these novel models can be connected to population data sets for purposes of calibration and validation.

T-111-OR
The Impact of Self-Reported Weight, Height and Dietary Intake on the Valid Estimation of Diet-Disease Associations
Jennifer M. Poti, Barry M. Popkin, Michelle A. Mendez Chapel Hill, NC

Background: Population-based studies often rely on self-reported weight, height, and dietary intake, yet it is unclear whether misreporting of weight and height is associated with dietary misreporting and how estimation of diet-disease associations is impacted. Methods: Among 1,850 adults from NHANES 2007-2010, dietary underreporters (19.8%) and overreporters (8.4%) were classified using the revised Goldberg method. The association between BMI error (measured BMI (BMI_m) minus BMI calculated from reported weight and height (BMI_r)) and dietary misreporting was estimated using linear regression. Diet-BMI and diet-metabolic syndrome (MetS) associations were estimated using linear and logistic regression, with or without adjustment for dietary misreporting and using BMI_m or BMI_r as an outcome or mediator. Results: Dietary underreporting was associated with error in BMI_m (adjusted β: 95% CI: -0.32, -0.55, -0.09), with underreporting BMI_m greatest for obese dietary underreporters (-1.58, -1.92, -1.24). Adjustment for dietary misreporting was necessary to yield significant associations between BMI and highest vs lowest intake of sugar sweetened beverages (SSB) (1.04; 0.15, 1.93), fast food (1.12; 0.20, 2.03), and red meat (0.82; 0.02, 1.61), yet results were robust to use of BMI_r. Self-reported data did not limit valid estimation of associations between diet and MetS. For example, the OR comparing highest vs lowest quintile of SSB intake was significant before (1.70; 1.12, 2.58) and after (1.76; 1.15, 2.70) adjustment for dietary misreporting, and conclusions from mediation analysis by BMI_m vs BMI_r did not differ. Conclusions: Error in BMI_m and dietary misreporting are associated. Although BMI_m error had little impact, adjustment for dietary misreporting may be necessary when estimating associations between diet and obesity, but not diet and obesity-related outcomes.